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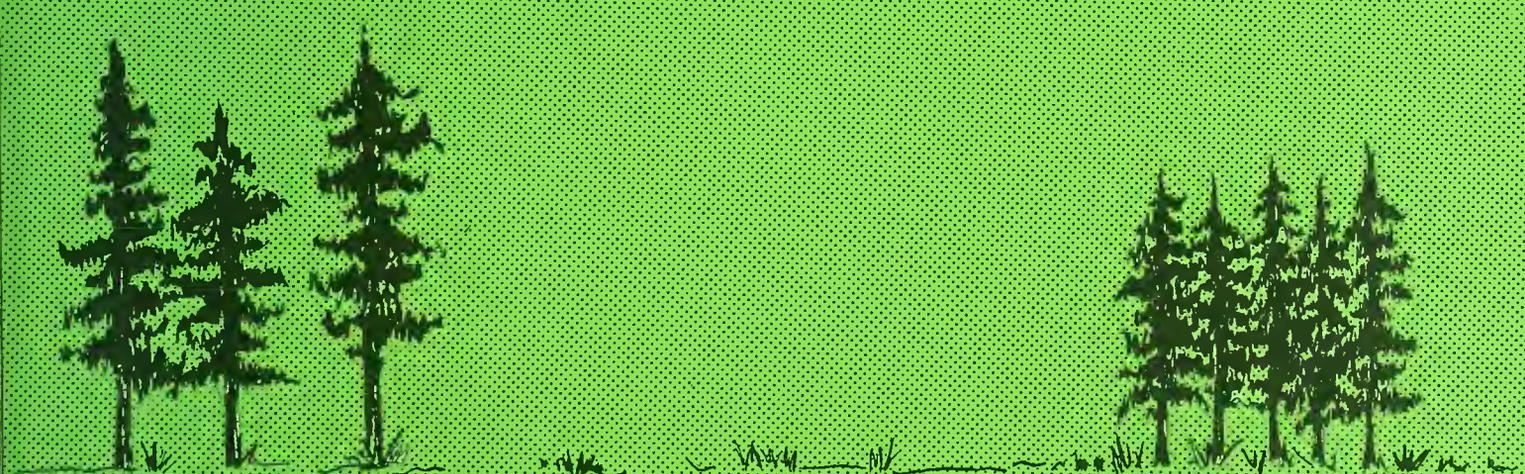
1976

LEVELS-OF-GROWING-STOCK COOPERATIVE STUDY IN DOUGLAS-FIR

REPORT NO. 4 ROCKY BROOK, STAMPEDE CREEK, AND IRON CREEK



PACIFIC NORTHWEST FOREST AND RANGE EXPERIMENT STATION
U.S. Department of Agriculture
Forest Service
Portland, Oregon

Levels-of-growing-stock study treatment schedule, showing percent of gross basal area increment of control plot to be retained in growing stock

Thinning	Treatment							
	1	2	3	4	5	6	7	8
	Percent							
First	10	10	30	30	50	50	70	70
Second	10	20	30	40	50	40	70	60
Third	10	30	30	50	50	30	70	50
Fourth	10	40	30	60	50	20	70	40
Fifth	10	50	30	70	50	10	70	30

Abstract for Report No. 1

Public and private agencies are cooperating in a study of eight thinning regimes in young Douglas-fir stands. Regimes differ in the amount of basal area allowed to accrue in growing stock at each successive thinning. All regimes start with a common level-of-growing-stock which is established by a conditioning thinning.

Thinning interval is controlled by height growth of crop trees, and a single type of thinning is prescribed.

Nine study areas, each involving three completely random replications of each thinning regime and an unthinned control, have been established in western Oregon and Washington, U.S.A., and Vancouver Island, Canada. Site quality of these areas varies from I through IV.

Climatic and soil characteristics for each area and data for the stand after the conditioning thinning are described briefly.

KEYWORDS: Thinnings, stand growth, Douglas-fir, *Pseudotsuga menziesii.*

LEVELS-OF-GROWING-STOCK COOPERATIVE STUDY IN DOUGLAS-FIR

Report No. 4--Rocky Brook, Stampede Creek, and Iron Creek

by

Richard L. Williamson, Mensurationist

USDA Forest Service Research Paper PNW-210

Pacific Northwest Forest and Range Experiment Station
Forest Service
U.S. Department of Agriculture

Portland, Oregon
1976

Other LOGS (levels-of-growing-stock) reports:

WILLIAMSON, RICHARD L., and GEORGE R. STAEBLER.
1965. A cooperative level-of-growing-stock study in Douglas-fir. USDA For. Serv. Pac. Northwest For. and Range Exp. Stn., 12 p., illus. Portland, Oreg.

Describes purpose and scope of a cooperative study which is investigating the relative merits of eight different thinning regimes. Main features of six study areas installed since 1961 in young stands are also summarized.

WILLIAMSON, RICHARD L., and GEORGE R. STAEBLER.
1971. Levels-of-growing-stock cooperative study on Douglas-fir. Report No. 1--Description of study and existing study areas. USDA For. Serv. Res. Pap. PNW-111, 12 p., illus. Pac. Northwest For. and Range Exp. Stn., Portland, Oreg.

Thinning regimes in young Douglas-fir stands are described. Some characteristics of individual study areas established by cooperating public and private agencies are discussed.

BELL, JOHN F., and ALAN B. BERG.
1972. Levels-of-growing-stock cooperative study on Douglas-fir. Report No. 2--The Hoskins study, 1963-1970. USDA For. Serv. Res. Pap. PNW-130, 19 p., illus. Pac. Northwest For. and Range Exp. Stn., Portland, Oreg.

A calibration thinning and the first treatment thinning in a 20-year-old Douglas-fir stand at Hoskins, Oregon, are described. Data tabulated for the first 7 years of management show that growth changes in the thinned stands were greater than anticipated.

Diggle, P. K.
1972. The levels-of-growing-stock cooperative study in Douglas-fir in British Columbia (Report No. 3, Cooperative L.O.G.S. Study Series). Can. For. Serv. Inf. Rep. BC-X-66, 46 p., illus. Pac. For. Res. Cent., Victoria, B.C.

Reference Abstract

Williamson, Richard L.
1976. Levels-of-growing-stock cooperative study in Douglas-fir. Report No. 4--Rocky Brook, Stampede Creek, and Iron Creek. USDA For. Serv. Res. Pap. PNW-210, 39 p., illus. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

The U.S. Forest Service maintains three of nine installations in a regional, cooperative study of influences of levels-of-growing-stock (LOGS) on stand growth. The effects of calibration thinnings are described for the three areas. Results of first treatment thinning are described for one area.

KEYWORDS: Thinnings, stand growth, Douglas-fir, *Pseudotsuga menziesii*.

RESEARCH SUMMARY

Research Paper PNW-210

1976

A regional, cooperative study of the influcence of levels-of-growing-stock on stand growth was initiated in 1962. The U.S. Forest Service maintains three of the nine study areas: Rocky Brook--established in 1963, in a 27-year-old, site index 90 stand; Stampede Creek--established in 1968, in a 32-year-old, site index 120 stand; and Iron Creek--established in 1966, in a 19-year-old, site index 160 stand.[1/] This report describes the status of these study areas during the initial phases of the experiment.

In all three areas, growth in all thinned stands was considerably below that in unthinned stands. The two older stands responded similarly to the calibration thinning, with growth percent of thinned stands about 25 percent better than that of the unthinned stands. The youngest stand, Iron Creek, was so young that all trees were essentially free growing, so that little growth stimulation of individual trees due to thinning was possible. Here, growth has been proportional to growing stock.

The essentially free-growing condition of trees in thinned stands at Iron Creek continued into the first treatment period, as the control stands began to show signs of competition.

So far, smaller trees (codominants) in thinned stands seem to be growing more efficiently than larger trees. More time is needed to substantiate this difference.

[1/] Site indices have 100-year basis.

Introduction

HISTORY OF THE STUDY

Federal and State agencies and private industry are cooperating in a study of the influence of levels-of-growing-stock (LOGS) on stand growth. All cooperators follow a common study plan designed to examine (1) cumulative wood production, (2) tree size development, and (3) growth-growing stock ratios as affected by eight different thinning regimes. The cooperators, study plan, and individual study areas have been described earlier (Williamson and Staebler 1971). Separate reports about three of the study areas have also been published (Bell and Berg 1972, Diggle 1972).

This report describes growth during the calibration period for the three U.S. Forest Service study areas described in Report No. 1--Rocky Brook, Stampede Creek, and Iron Creek. Site quality at these three study areas ranges from mid-V at Rocky Brook through high-IV at Stampede Creek to mid-II at Iron Creek. Respective total ages at start of the calibration period were 27 (a correction of Report No. 1), 32, and 19 years. Only the calibration period has been completed in the Rocky Brook and Stampede Creek areas (Rocky Brook 1963-69, Stampede Creek 1968-73); the first treatment period has also been completed in the Iron Creek area (calibration period 1966-70, first treatment period 1971-73).

Methods

Details of experimental techniques and concepts are in appendix I, p. 9. One of the few instances where the study plan allows some discretion is in deciding whether to base the calibration thinning (reduction of growing stock to a common level among thinned plots at start of calibration period) on basal area or number of trees. At Rocky Brook, calibration thinning was based on preserving a common number of trees among plots; at the other two areas, it was based on preserving a common basal area among plots. The latter technique resulted in less variation in residual cubic volume among plots than did the former (tables 1, 2, 3, p. 11, 12, 13) when variation was expressed as a percentage of the mean volume.

Results and Discussion

Data on mortality and stand growth and development with respect to cubic volume, basal area, height, and quadratic mean diameter[2/] are presented below for the calibration period for all three areas. Growth in cubic volume, basal area, and quadratic mean diameter are then presented for the first treatment period for Iron Creek. Growth is also presented separately for "All Trees" and "Crop Trees" categories.

MORTALITY

The Rocky Brook area had the lowest site quality of the three areas and also the greatest density before the calibration thinning, as indicated by control plot densities. Moreover, residual volume at Rocky Brook averaged only 43 percent of volume before the calibration thinning compared with 61 percent at the other two areas (fig. 1, and table 4, p. 14). The drastic release at Rocky Brook probably increased environmental stress on residual trees. Trees in this area also sustained crown damage from a very deep, heavy snow which occurred soon (October to December) after the thinning. Mortality was generally heavier in thinned stands than in control stands (table 5, p. 15)--probably because the storm occurred so soon after the thinning. Seven plots were damaged so severely they had to be replaced. Mortality in some treatments averaged as high as 13 percent of the growing stock left after the thinning.

[2/] Diameter of tree of average basal area.

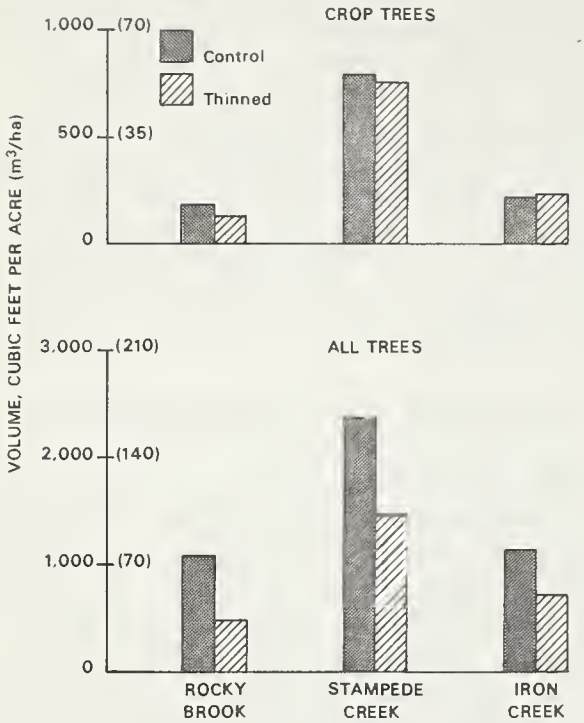


Figure 1.--Cubic volumes per acre after the calibration thinning, by study area.

Trees in the Stampede Creek area had no serious injury or mortality (table 6, p. 15). It differs from the other two areas mainly by being of natural origin and, consequently, having a greater range in individual tree ages and sizes.

The Iron Creek area had much mortality (table 7, p. 16) caused by the root pathogen *Armillaria mellea* Vahl. ex Fr. and by black bear. The root pathogen was apparently given impetus by a very severe drought during the 1967 growing season.

Black bear girdled many trees throughout this area before study establishment, and many of the trees left standing after the calibration thinning had been partially girdled. A bear went over a protective fence broken down by snow in spring 1972, girdled about 40 additional trees throughout the area, and killed 22 of these. These two kinds of damage have lowered site occupancy to an unknown degree on three plots.

GROWTH DURING CALIBRATION PERIOD

Cubic Volume

ALL TREES

The calibration thinning in all three areas was a heavy one by any standard. It is not surprising, therefore, that annual cubic volume[3/] growth of the thinned stands was considerably below that of the control stands during the calibration period (table 4, p. 14 , also fig. 2 and tables 8, 9, 10, p. 17 , 19 , 20). Metric equivalent tables follow tables 8, 9, and 10.

3/ All cubic volumes are based on volume equations described in Bruce and DeMars (1974).

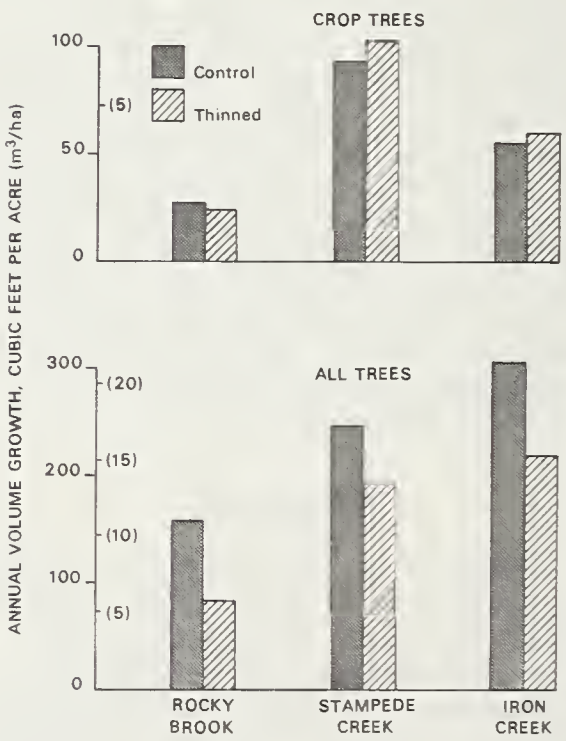


Figure 2.--Calibration period gross growth in cubic volume per acre, per year for three study areas.

At Rocky Brook, a remeasurement was available after 2 years of the calibration period. This measurement showed that growth of all trees on thinned plots was depressed (33 percent of the growth on control plots) during the first 2 years after thinning, then improved (66 percent of control) during the last 4 years, averaging 52 percent for the total period.

Growth at Iron Creek would be somewhat higher if stand age was more comparable to those at the other two areas. Stand ages at Stampede Creek and Rocky Brook are near those at which culmination of periodic annual growth in cubic feet occurs. Stand age at Iron Creek is much below that where culmination occurs.

Since no thinned plot has cubic volume growth even approaching that of its associated control plots, it is useless to speculate now on which stand will end up giving the best response to thinning in terms of absolute growth. Comparisons of absolute growth are confounded by differences in stand age, site index, mortality either before or immediately after the calibration cut, and intensity of the calibration cut. I will assume for now that response can be estimated by the ratio of growth percents for thinned and unthinned stands--(thinned stand growth/thinned stand growing stock)/(control growth/control growing stock). With no response or depression, this ratio would be nearly 1.00.[4/]

In spite of the especially heavy cut and severe snow damage at Rocky Brook, response in cubic volume growth (total stem) to thinning here has been about as good as that at the Stampede Creek area. The ratios for the three areas are 1.23, 1.26, and 1.14 for Rocky Brook, Stampede Creek, and Iron Creek, respectively. In absolute terms, though, growth in these young stands increases with site index and age.

CROP TREES

The remeasurement at Rocky Brook in 1965 showed that volume growth of crop trees in all thinned plots declined relative to that of crop trees in the control plots in the first 2 years (1964-65) of the calibration period (table 11, p. 22). This may be a consequence of the environmental stress of the calibration thinning and crown damage from heavy snow. In the last 4 years (1966-69), growth differences were slight. It may seem contradictory that crop trees in thinned plots at Rocky Brook grew a little less than those in control plots, whereas growth percents for the total stands indicate growth response for all trees in thinned stands. The explanation, which may involve different growth response by different tree sizes, will be discussed later under "Growth Efficiency of Individual Trees" (p. 7).

At Stampede Creek and Iron Creek, where intensity of calibration thinning was lighter than at Rocky Brook, crop tree growth in thinned stands was 11 and 15 percent, respectively, better than growth in associated control stands (tables 12 and 13, p. 22 , 23).

Basal Area

ALL TREES

Reductions in basal area growth of thinned stands at all three areas were proportionately quite comparable to their reductions in cubic volume growth (tables 8, 9, 10, p. 17 , 19 , 20).

At Rocky Brook, just as with cubic volume growth, there was a greater reduction in the first 2 years of the calibration period than in the last 4 years.

Results from these three study areas (tables 7, 8, 9, p. 16 , 17 , 19) illustrate

[4/] With no response or depression, this ratio would be exactly 1.00 if all trees grew at the same rate. In fact, they do not, but these ratios do indicate relative response between study areas since all areas were thinned the same way.

how difficult it can be to predict volume growth response via basal area growth response, when the technique described above for volume growth response is used. At Rocky Brook, basal area and volume growth responses were 1.31 and 1.23, respectively, so basal area growth slightly overestimated volume growth. At Stampede Creek, basal area growth response greatly overestimated volume growth response, with values of 1.46 and 1.26, respectively. The overestimate at Iron Creek was moderate, with response values of 1.28 and 1.14. It is interesting to note that, in all cases, basal area response overestimated volume growth response.

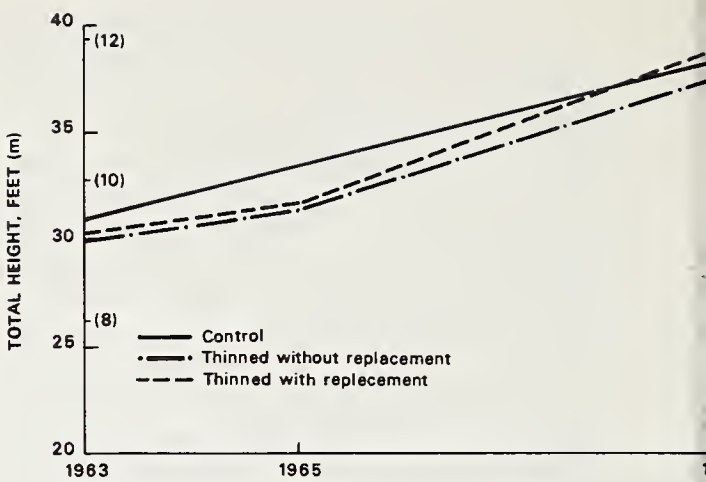


Figure 3.--Total height during the calibration period for thinned and control plots, crop trees only, Rocky Brook.

CROP TREES

As for "All Trees," crop trees in thinned stands at Rocky Brook showed a decline in growth the first 2 years of the calibration period. During the last 4 years, growth was virtually the same as for crop trees in control stands (table 11, p. 22).

Crop trees in thinned stands at Stampede Creek and Iron Creek grew moderately better than crop trees in control plots (tables 12, 13, p. 22 , 23).

Also as for "All Trees," basal area growth has been a poor predictor of volume growth.

Height Growth

Height growth of crop trees in thinned stands at Rocky Brook is improving after a decline the first 2 years (fig. 3 and table 14, p. 23). Control crop trees grew only 70 percent as much in height in the last 4 years of the calibration period as did crop trees in the thinned stands. The differences in height growth are not statistically significant ($p \leq 0.05$), but I think the treatment means are valid indicators of height growth response. The initial decline in the thinned stands is probably due to "shock" and agrees with results at another low-site area (Staebler 1956). No such decrease in height growth of crop trees on thinnned plots at Iron Creek and Stampede Creek has been observed (tables 15, 16, p. 24 , 25).

Diameter Breast High

Diameter growth trends are as expected (fig. 4 and tables 8, 9, 10, 11, 12, 13, p. 17, 19, 20 , 22 , 22 , 23), increasing with increasing site index, showing substantial improvement in thinned stands when considering all trees, and slight improvements for crop trees in thinned stands. The reduction of average diameter growth of all trees in control plots at Stampede Creek relative to that at Rocky Brook is probably due to greater stand age, greater average tree size, and more severely suppressed trees.

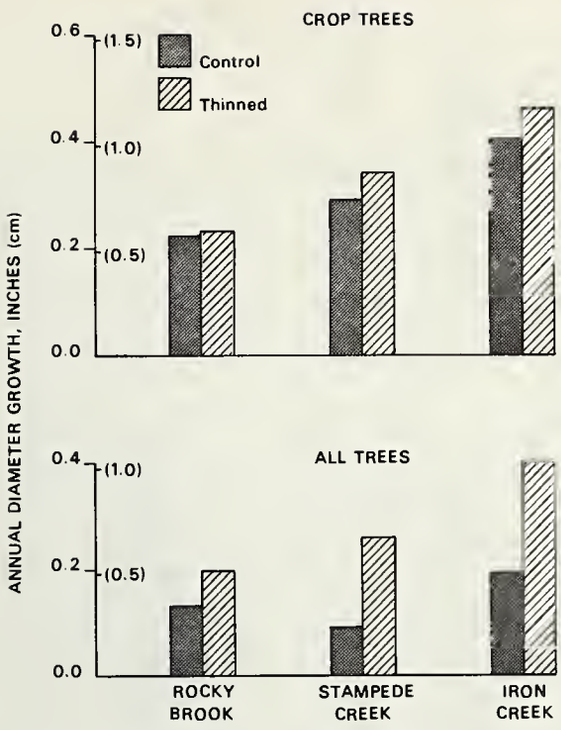


Figure 4.--Calibration period gross growth in quadratic mean diameter per year for three study areas.

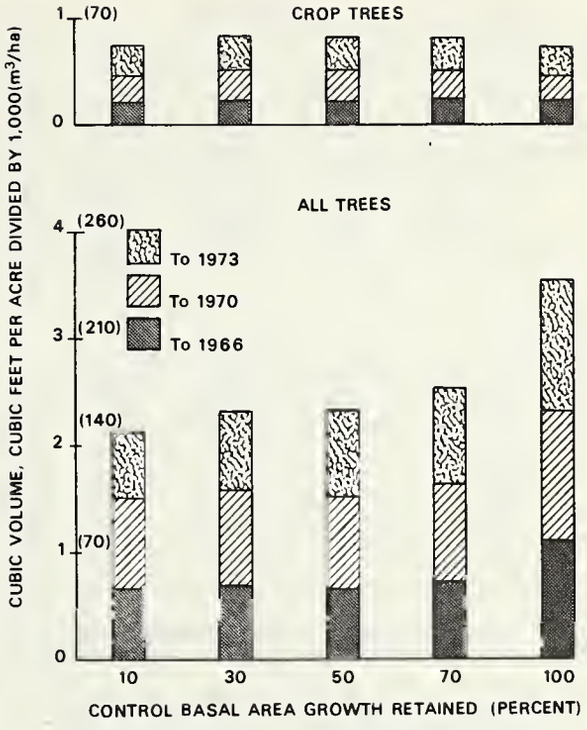


Figure 5.--Gross cubic volume yield by treatments and measurement period, for Iron Creek area.

GROWTH DURING FIRST TREATMENT PERIOD AT IRON CREEK

Cubic Volume

ALL TREES

As expected, the total yield of control plots at this early stage of the experiment is outstripping that of thinned plots (fig. 5 and table 10, p. 20). Gross cubic volume growth among thinned plots is proportional to growing stock (fig. 6). Even though it appeared to me that mortality since the calibration thinning reduced site occupancy to an unknown degree on some plots (primarily in treatments 3 and 4), any effect of this reduction is not apparent in figure 6. This trend (fig. 6) is statistically highly significant ($p \leq 0.01$). Consequently, there is no significant trend in volume growth percent (fig. 7 and table 10, p. 20).

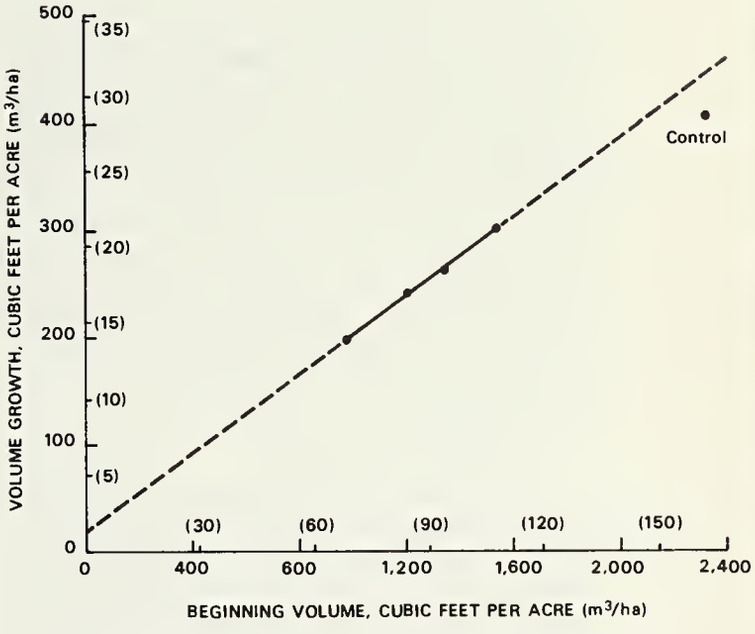


Figure 6.--Annual gross cubic volume growth during the first treatment period related to growing stock at start of the period, Iron Creek area.

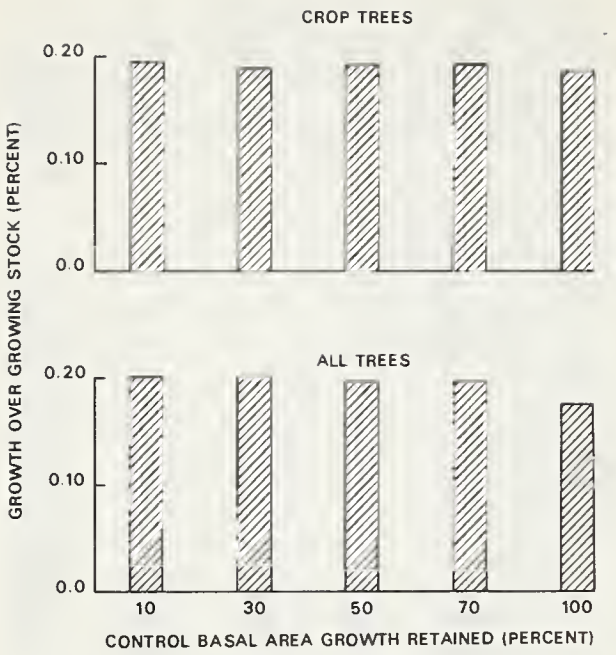


Figure 7.--First treatment period (1970-73) gross volume growth divided by volume at start of period by treatments, for Iron Creek area.

These results mean that trees are essentially free growing in all the thinned stands. Thus, growth has been proportional to growing stock, another indication of the overriding influence of the calibration thinning.

Growth percent of control plots is slightly less than that for thinned stands; thus competition in control plots is probably beginning.

CROP TREES

There are no significant differences between treatments in volume growth of crop trees (fig. 5 and table 13, p. 23) nor in their volume growth percent (fig. 7). This illustrates, as with the "all trees" category, the lack of competition thus far in thinned stands at Iron Creek.

Basal Area

ALL TREES

There has been a highly significant ($p \leq 0.01$) linear trend in basal area growth with respect to starting basal area during the first treatment period (fig. 8 and table 10, p. 20), as well as a highly significant negative linear trend in basal area growth percent (fig. 9). One might infer from this trend in growth percent that growth efficiency in these stands improves as stands go from dense to open. Since this contradicts the results for volume growth, above, we see, again, as in the calibration period, that basal area growth can be a poor predictor of volume growth. On the positive side, basal area growth (like d.b.h. growth) may be a more sensitive indicator of developing competition than is volume growth.

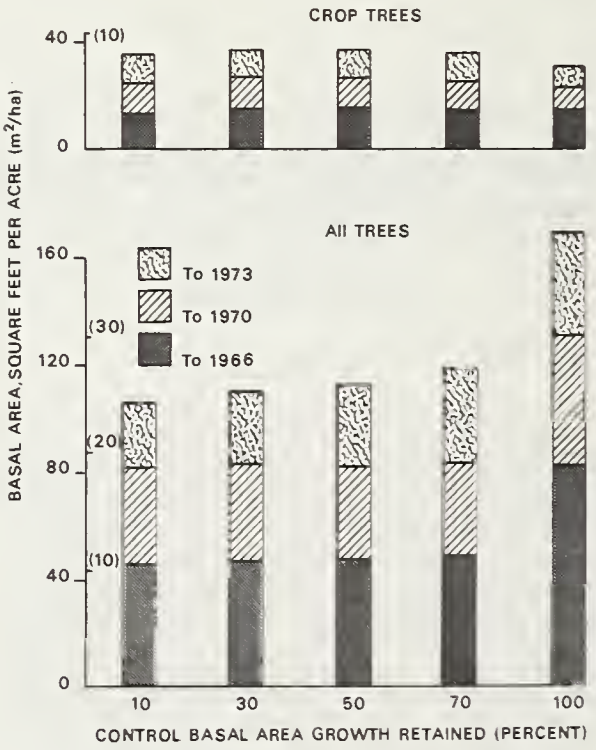


Figure 8.--Gross basal area yield by treatments, by measurement period, for Iron Creek area. Sloping lines connect levels of residual basal area after the first treatment thinning.

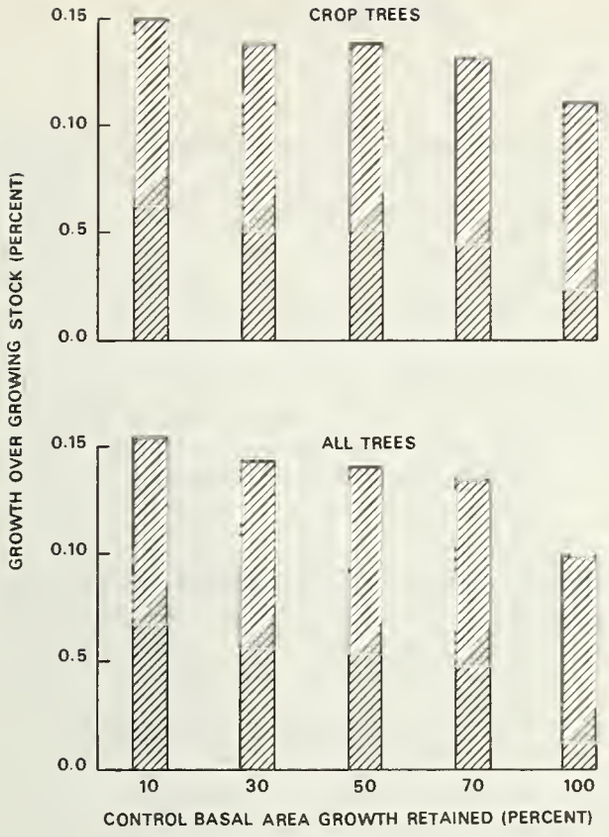


Figure 9.--First treatment period (1970-73) gross basal area growth divided by basal area at start of period, by treatments, for Iron Creek area.

CROP TREES

Basal area growth of crop trees did not differ significantly between thinned and control stands (fig. 8); neither did growth percent of crop trees (fig. 9). This substantiates the general lack of competition in this stand so far. The differences, though statistically insignificant, indicate that competition is about to become a strong influence in control stands.

Diameter Breast High

ALL TREES

Change in quadratic mean diameter has followed a logical, but slight, linear trend among treatments, with the most diameter growth in the most open treatment (table 10, p. 20). This is an indication that competition was just beginning to affect the denser thinned stands. Another indication is that improvement over calibration period growth is generally greater for more open treatments than it is for denser ones.

CROP TREES

Trends for crop trees (table 13, p. 23) have paralleled those for all trees, with slightly more growth in most open treatments when compared with denser ones, and with greater improvement over calibration period growth in more open treatments.

Growth Efficiency of Individual Trees

So far, no definite conclusions can be drawn from the Iron Creek data as to which trees, bigger or smaller initially, are the most efficient producers of volume. I assume efficiency is indicated by periodic volume growth percent, $(V_2 - V_1)/V_1$, where V_1 and V_2 are beginning and ending volumes, respectively. Linear regressions by plots of volume growth percent of individual height-measured trees over their initial volumes for the first treatment period were significant for only 6 of the 24 treated plots. Of the 24 regression coefficients, 20 were negative, including those for the 6 significant ones. This suggests that codominants (the smallest trees left during the calibration thinning) are more efficient producers than dominants. This agrees with results from another study area[5/] and is logical since codominants are under more competitive stress before thinning than are dominants. Codominants possibly responding to thinning more than dominants may explain why growth percent of all trees for thinned stands at Rocky Brook is better than that of controls, in spite of the fact that crop trees (all dominants) in thinned plots grew less than those in control plots.

5/ Study C-8. Data on file at Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

Because of the impact this result should have on marking guidelines for thinnings, this result should be substantiated over longer periods. Future work will keep track of trends in growth efficiency and, further, relate these trends to individual tree competition indices. All cooperators in the LOGS studies will be involved in this work and will also compare results between study areas to derive growth trends according to site index and stand structure.

Discussion

Which stand will respond best to thinning? This will be difficult to tell, since these stands differ in age, site index, and prethinning stand conditions. The Iron Creek stand is a plantation and so young that all trees, including those on control plots, have been essentially free-growing. Even so, control plot growth has been equivalent to that of site index 210 (McArdle et al. 1961).

The Stampede Creek stand was fairly widely spaced from the start, though stocking was good in 1968. A consequence of the wide and fairly uniform spacing has been amazing growth of control plots similar to that of plantations (Worthington 1961) and also equivalent to that of site index 210.

The Rocky Brook stand, though fairly dense at the start, was still less dense than a normal stand; and control plot growth was like that of site index 110.

What chance does a thinned stand have to look good when "control" stands grow so well? Results thus far argue more for early control of spacing than they do for later thinnings. The future, however, will bring meaningful comparisons of treatment effects on stand volume growth and on how site index influences these effects.

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Appendix I.

Description of Experiment

(as excerpted from Report No. 1)

The experiment is designed to test a number of thinning regimes beginning in young stands made alike at the start through a "calibration" thinning. Thereafter, through the time required for 60 feet of height growth, growing stock is controlled by allowing a specified addition to the growing stock between successive thinnings. Any extra growth is cut and is one of the measured effects of the thinning regime.

EXPERIMENTAL DESIGN

A single experiment consists of eight thinning regimes plus unthinned plots whose growth is the basis for treatment in these regimes. There are three plots per treatment arranged in a completely randomized design for a total of twenty-seven 1/5-acre plots.

Interaction of site quality and treatment can be evaluated by replicating installations on each site quality class. Cooperative effort has made this replication possible.

CROP TREE SELECTION

Well-formed, uniformly spaced, dominant trees at the rate of 80 per acre, or 16 per plot, are designated as crop trees before initial thinning. Each quarter of a plot must have no fewer than three suitable crop trees nor more than five--another criterion for stand uniformity.

INITIAL OR "CALIBRATION" THINNING

All 24 treated plots are thinned initially to the same density to minimize the effect of variations in original density on stand growth. Density of residual trees is controlled by quadratic mean diameter (diameter of tree of average basal area) of the residual stand according to the formula:

Average spacing in feet
= 0.6167 (quadratic mean d.b.h.) + 8.

If one concentrates on leaving a certain amount of basal area corresponding to an estimated overall quadratic mean d.b.h. ($\overline{D}q$), then the residual number of trees may vary freely and the actual $\overline{D}q$'s may vary ± 10 percent between plots. Alternatively, if emphasis is on leaving a certain number of trees corresponding to an estimated overall $\overline{D}q$, then the basal area may vary and the actual $\overline{D}q$'s may vary ± 15 percent between plots.

TREATMENTS

The eight thinning regimes differ in the amount of basal area allowed to accumulate in the growing stock. The amount of growth retained at any thinning is a predetermined percentage of the gross increase found in the unthinned plots since the last thinning (table inside front cover). The average residual basal area for all thinned plots after the calibration thinning is the foundation upon which all future growing stock accumulation is based. As used in the study, control plots may be thought of as providing a "local gross yield table" for the study area.

CONTROL OF THINNING INTERVAL

Thinnings will be made after the calibration thinning whenever average height growth of crop trees comes closest to each multiple of 10 feet.

CONTROL OF TYPE OF THINNING

As far as possible, type of thinning is eliminated as a variable in the

treatment thinnings through several specifications:

1. No crop tree may be cut until all noncrop trees have been cut (another tree may be substituted for a crop tree damaged by logging or killed by natural agents).
2. The quadratic mean diameter of cut trees should approximate that of trees that are available for cutting.
3. The diameters of cut trees should be distributed across the full diameter range of trees available for cutting.

The first treatment thinning at Iron Creek, carefully controlled according to study plan specifications, has resulted in a d.b.h. distribution of cut trees (fig. 10) that agrees well with the "free thinning" method described by Braathe (1957). In this method, weaker dominants and codominants are cut to release stronger dominants and codominants. Trees in the lower crown classes may also be cut if required by prescribed cutting intensity.

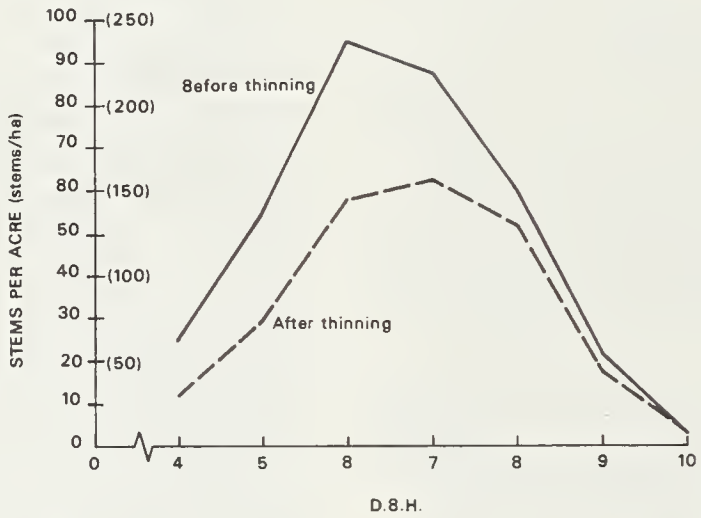

Figure 10.--Number of trees per acre (per hectare) for treatment 4, before and after the first treatment thinning, 1970, Iron Creek area.

TABLE 1. STAND DATA FOR ALL LIVE TREES, BY TREATMENT AND PLOT, AT BEGINNING AND END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK)

TREATMENT AND PLOT NUMBERS		NUMBER TREES PER ACRE				QUADRATIC MEAN D.B.H. (INCHES)				BASAL AREA PER ACRE (SQUARE FEET)				TOTAL STEM VOLUME PER ACRE (CUBIC FEET)			
		START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969
1:	024	400	400	400	395	3.7	4.2	4.2	4.9	30.5	39.1	39.1	51.7	352	478	478	743
	032	400	330	330	320	4.3	4.7	4.7	5.5	35.7	39.6	39.6	52.4	461	517	517	810
	036	400	350	350	350	4.4	4.8	4.8	5.6	43.2	44.6	44.6	59.6	567	661	661	1024
2:	006	395	345			4.0	4.4			33.8	35.7			444	459		
	020	400	385	385	370	3.8	4.4	4.4	5.1	31.7	40.7	40.7	53.2	380	505	505	796
	030	400	340	340	340	4.2	4.9	4.9	5.7	38.9	44.4	44.4	59.2	529	626	626	979
	044			400	380			4.6	5.5			45.6	62.0			587	1082
3:	011	400	400	400	375	4.3	4.8	4.8	5.7	39.7	49.5	49.5	65.5	475	671	671	1053
	016	400	385	385	375	3.9	4.3	4.3	5.0	32.8	39.7	39.7	51.8	394	494	494	737
	031	400	315			4.0	4.7			35.0	38.6			468	529		
	040			400	400			4.6	5.3			46.2	61.0			559	943
4:	010	400	395	395	375	4.3	4.8	4.8	5.6	39.6	49.4	49.4	64.3	499	654	654	1017
	013	400	400	400	400	4.0	4.5	4.5	5.1	35.3	44.7	44.7	56.7	441	582	582	868
	019	400	355	355	330	4.1	4.7	4.7	5.6	36.6	42.8	42.8	55.5	516	609	609	988
5:	009	400	395	395	385	4.0	4.5	4.5	5.1	34.7	42.9	42.9	53.5	414	531	531	789
	015	400	385	385	370	4.0	4.5	4.5	5.1	34.2	42.1	42.1	53.1	417	547	547	824
	021	400	355	355	355	4.0	4.7	4.7	5.5	34.6	42.9	42.9	58.8	435	557	557	925
6:	008	400	375			4.0	4.4			34.2	39.4			470	567		
	033	390	295			3.7	4.3			29.0	29.5			384	395		
	034	400	335			3.9	4.5			32.8	36.7			453	521		
	041			400	400			4.8	5.6			50.5	68.7			697	1201
	042			400	380			4.5	5.3			44.5	58.9			550	975
	043	335	400	390	390	4.4	4.7	5.4	5.4	35.2	47.1	63.2	62.1	494	613	1072	1039
7:	003	400	315			4.0	4.7			35.3	37.9			451	505		
	025	400	395	395	390	4.0	4.6	4.6	5.3	35.0	45.0	45.0	58.7	433	571	571	869
	035	400	305			4.2	4.9			39.0	40.7			548	557		
	038			400	375			4.4	5.3			42.0	56.5			526	939
	039			400	400			4.6	5.3			45.9	61.0			605	1045
8:	012	400	380	380	380	4.1	4.5	4.5	5.2	35.8	42.4	42.4	55.2	454	550	550	842
	023	400	360	360	355	4.2	4.9	4.9	5.7	38.7	46.9	46.9	62.0	535	690	690	1105
	028	400	365	365	365	4.1	4.7	4.7	5.3	36.0	43.5	43.5	56.4	470	565	565	882
CONTROL:	014	1450	1440	1440	1420	3.1	3.5	3.5	3.9	75.0	95.3	95.3	116.4	838	1155	1155	1594
	027	1190	1150	1150	1150	3.6	4.0	4.0	4.5	83.5	102.4	102.4	128.0	1097	1486	1486	2172
	029	1460	1415	1415	1380	3.6	4.0	4.0	4.3	103.0	123.9	123.9	142.5	1276	1689	1689	2223

TABLE 2. STAND DATA FOR ALL LIVE TREES, BY TREATMENT AND PLOT, AT BEGINNING AND END OF CALIBRATION PERIOD: 1968 AND 1973

(STAMPEDE CREEK)

TREATMENT AND PLOT NUMBERS		NUMBER TREES PER ACRE		QUADRATIC MEAN D.B.H. (INCHES)		BASAL AREA PER ACRE (SQUARE FEET)		TOTAL STEM VOLUME PER ACRE (CUBIC FEET)	
		START 1968	END 1973	START 1968	END 1973	START 1968	END 1973	START 1968	END 1973
1:	041	300	295	6.4	7.8	67.6	98.5	1470	2501
	072	285	285	6.8	8.2	71.8	103.6	1599	2537
	126	295	295	6.4	7.6	66.7	92.9	1355	2306
2:	091	285	280	6.6	7.8	68.0	92.8	1430	2324
	112	295	295	6.3	7.7	64.2	94.2	1331	2289
	113	275	270	6.8	8.3	70.1	100.5	1556	2549
3:	051	295	295	6.6	7.9	71.0	101.8	1541	2567
	103	290	285	6.6	7.9	68.9	96.9	1407	2365
	121	275	275	6.6	8.0	68.3	96.9	1439	2367
4:	071	290	285	6.7	8.1	70.7	102.3	1491	2618
	082	320	305	6.2	7.5	67.1	94.6	1357	2258
	115	270	260	6.9	8.2	69.8	95.1	1468	2409
5:	092	275	270	6.9	8.4	71.7	103.3	1641	2703
	114	275	275	6.6	7.8	64.4	91.7	1361	2254
	125	295	295	6.5	7.7	68.1	94.4	1453	2392
6:	032	340	330	6.0	7.2	66.7	93.9	1359	2182
	101	290	290	6.5	7.9	66.6	98.3	1403	2289
	102	330	325	5.8	7.1	60.7	89.6	1192	2119
7:	062	275	265	6.8	8.2	68.9	97.8	1483	2539
	106	290	290	6.7	7.9	70.5	100.1	1563	2527
	107	270	270	6.7	8.0	67.0	93.6	1585	2446
8:	096	230	230	7.4	8.8	68.9	96.9	1544	2629
	111	275	270	6.4	7.8	62.0	90.5	1340	2164
	116	250	250	7.0	8.3	67.3	93.6	1509	2410
CONTROL:	061	1005	965	4.7	5.4	121.0	153.9	2478	3664
	105	685	815	5.3	5.6	104.0	136.9	2048	3317
	122	1295	1235	4.3	4.9	131.8	164.1	2521	3665

TABLE 3. STAND DATA FOR ALL LIVE TREES, BY TREATMENT AND PLOT, AT BEGINNING AND END OF PERIODS: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK)

TREATMENT AND PLOT NUMBERS		NUMBER TREES PER ACRE				QUADRATIC MEAN D.B.H. (INCHES)				BASAL AREA PER ACRE (SQUARE FEET)				TOTAL STEM VOLUME PER ACRE (CUBIC FEET)			
		PERIODS				PERIODS				PERIODS				PERIODS			
		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT	
		START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973
1:	021	350	345	205	205	4.9	6.4	6.9	8.3	45.0	78.1	52.9	77.7	610	1369	945	1581
	033	360	355	225	210	4.7	6.4	6.6	8.1	44.0	79.5	53.1	75.6	637	1478	998	1660
	051	355	330	240	200	4.6	6.3	6.3	7.8	41.3	70.5	52.8	66.6	553	1263	949	1347
2:	082	360	355	200	195	5.0	6.8	6.9	8.4	49.3	88.1	52.5	74.5	743	1725	1038	1795
	091	365	340	205	160	4.7	6.4	6.7	8.1	44.8	76.5	50.4	65.3	647	1450	971	1461
	101	350	335	180	180	5.2	6.9	7.2	8.7	52.1	88.0	51.1	75.0	814	1727	1017	1682
3:	031	355	350	275	270	4.8	6.3	6.4	7.7	43.9	75.0	61.9	87.1	605	1316	1095	1835
	042	335	335	215	210	5.3	7.0	7.3	8.7	51.0	88.7	62.2	86.8	734	1719	1216	1900
	052	355	335	255	230	4.8	6.4	6.7	8.2	43.9	75.9	61.6	84.2	605	1388	1141	1769
4:	013	335	330	200	190	5.3	7.1	7.5	9.1	51.7	90.6	61.8	85.4	815	1760	1230	1959
	062	385	375	270	250	4.7	6.3	6.5	7.9	45.7	80.6	61.8	85.2	657	1528	1194	1785
	111	350	340	240	225	5.1	6.8	6.9	8.3	49.7	84.5	63.2	84.7	821	1769	1337	2070
5:	012	345	335	275	275	5.1	6.7	6.9	8.2	48.2	82.5	71.4	101.6	740	1605	1403	2305
	041	335	330	255	255	5.3	6.9	7.2	8.6	51.1	85.6	71.3	102.3	773	1670	1403	2337
	072	360	350	300	290	4.9	6.4	6.6	7.8	46.5	79.4	71.3	95.3	686	1489	1345	2066
6:	015	350	335	290	285	4.9	6.6	6.8	8.1	46.3	80.6	72.0	102.3	675	1466	1319	2126
	043	370	350	315	290	4.8	6.4	6.4	7.8	45.9	79.1	71.5	96.1	597	1391	1259	1905
	081	360	345	315	310	4.7	6.4	6.5	7.8	43.9	77.5	72.1	101.7	616	1428	1332	2225
7:	011	345	340	305	305	5.3	6.9	7.0	8.3	52.2	86.5	81.3	114.6	783	1678	1544	2586
	023	355	345	340	335	4.9	6.6	6.6	7.7	46.8	81.3	79.5	109.6	678	1514	1479	2383
	063	375	350	350	310	4.8	6.5	6.5	7.8	48.1	80.4	80.4	102.6	731	1560	1560	2354
8:	014	340	330	290	285	5.3	7.1	7.2	8.6	51.7	89.7	80.8	113.9	812	1712	1544	2534
	053	360	350	345	310	4.9	6.6	6.6	7.6	46.4	82.9	81.6	101.7	676	1562	1537	2151
	073	355	355	305	270	5.1	6.7	6.9	8.3	49.5	87.6	80.4	102.3	802	1727	1604	2370
CONTROL:	022	1175	1255	1255	1200	3.8	4.6	4.6	5.2	93.6	143.0	143.0	177.9	1272	2633	2633	3880
	025	1185	1225	1225	1255	3.6	4.5	4.5	5.0	84.2	132.8	132.8	172.3	1133	2305	2305	3527
	071	1015	1090	1090	1100	3.5	4.3	4.3	4.9	68.7	112.6	112.6	144.0	931	2025	2025	2999

Table 4. Calibration period stand statistics for three Forest Service study areas. All volumes per acre (per hectare).

Statistics	Rocky Brook	Stampede Creek	Iron Creek
S.I.	80	95	127
Total age at establishment	27	32	19
Calibration period	1964-69	1969-73	1967-70
Calibration period annual growth - ft^3 (m^3)			
thinned	83 (5.80)	253 (17.70)	219 (15.32)
control	159 (11.13)	340 (23.79)	304 (21.27)
thinned ÷ control X 100	52	74	72
Cubic volume at start of calibration period			
thinned	458 (32.05)	1,200 (83.98)	700 (48.99)
control	1,070 (74.88)	2,010 (140.66)	1,120 (78.38)
thinned ÷ control X 100	43	60	62

TABLE 5. PERIODIC ANNUAL MORTALITY OF ALL TREES, BY TREATMENT, FROM BEGINNING TO END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK AREA. QUADRATIC MEAN D.B.H. IS PERIODIC.)

TREATMENT NUMBERS	NUMBER TREES PER ACRE (ROUNDED TO NEAREST WHOLE TREE)		QUADRATIC MEAN D.B.H. (INCHES)		BASAL AREA PER ACRE (SQUARE FEET)		TOTAL STEM VOLUME PER ACRE (CUBIC FEET)	
	1963-1965	1965-1969	1963-1965	1965-1969	1963-1965	1965-1969	1963-1965	1965-1969
1	20	1	3.6	4.0	1.44	.11	17.2	1.4
2	21	3	3.6	4.6	1.46	.33	16.8	4.9
3	16	3	3.3	3.6	.98	.20	11.7	2.7
4	9	4	3.6	4.2	.56	.36	7.0	5.3
5	11	2	3.3	3.6	.66	.15	7.6	1.7
6	31	3	3.5	3.4	2.04	.16	23.9	2.1
7	31	3	3.4	3.5	2.00	.17	22.2	2.1
8	16	1	3.6	4.1	1.13	.04	13.8	.6
CONTROL	16	5	3.0	2.5	.76	.16	9.6	1.9

TABLE 6. PERIODIC ANNUAL MORTALITY OF ALL TREES, BY TREATMENT, FROM BEGINNING TO END OF CALIBRATION PERIOD: 1968 TO 1973

(STAMPEDE CREEK AREA. QUADRATIC MEAN D.B.H. IS PERIODIC.)

TREATMENT NUMBERS	NUMBER TREES PER ACRE (ROUNDED TO NEAREST WHOLE TREE)	QUADRATIC MEAN D.B.H. (INCHES)	BASAL AREA PER ACRE (SQUARE FEET)	TOTAL STEM VOLUME PER ACRE (CUBIC FEET)
1	0	6.3	.07	1.5
2	1	6.4	.15	3.6
3	0	6.3	.07	1.5
4	2	5.9	.37	7.8
5	0	3.7	.02	.4
6	1	4.9	.13	2.6
7	1	4.5	.07	1.4
8	0	3.0	.02	.2
CONTROL	14	2.3	.41	5.7

TABLE 7. PERIODIC ANNUAL MORTALITY OF ALL TREES, BY TREATMENT AND PERIODS: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK AREA. QUADRATIC MEAN D.B.H. IS PERIODIC.)

TREATMENT NUMBERS	NUMBER TREES PER ACRE (ROUNDED TO NEAREST WHOLE TREE)		QUADRATIC MEAN D.B.H. (INCHES)		BASAL AREA PER ACRE (SQUARE FEET)		TOTAL STEM VOLUME PER ACRE (CUBIC FEET)	
	1966-1970	1970-1973	1966-1970	1970-1973	1966-1970	1970-1973	1966-1970	1970-1973
1	3	6	4.4	6.6	.30	1.46	4.8	28.0
2	4	3	5.0	7.7	.52	1.07	6.7	24.1
3	2	4	4.4	6.6	.22	.92	3.3	18.5
4	2	5	4.8	6.9	.26	1.30	4.4	28.9
5	2	1	4.8	8.2	.26	.41	4.5	8.9
6	4	4	4.3	6.4	.42	.88	6.5	16.4
7	3	5	4.7	6.6	.40	1.20	7.3	26.4
8	2	8	4.5	7.7	.18	2.68	2.9	57.1
CONTROL	7	17	2.5	3.5	.24	1.08	3.5	22.8

TABLE 8. GROSS PERIODIC ANNUAL GROWTH, WITH TOTAL GROWTH AND CUMULATIVE VOLUME YIELD, FOR ALL TREES, IN ENGLISH UNITS, BY TREATMENT, FROM BEGINNING TO END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK)

TREATMENT NUMBERS	QUADRATIC MEAN D.B.H. (INCHES)						BASAL AREA PER ACRE (SQUARE FEET)					
	PERIODIC ANNUAL GROWTH (1963-1965)		PERIODIC ANNUAL GROWTH (1965-1969)		TOTAL (1963-1969)		PERIODIC ANNUAL GROWTH (1963-1965)		PERIODIC ANNUAL GROWTH (1965-1969)		TOTAL (1963-1969)	
	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT
1	.20	4.9	.18	3.9	1.1	27	3.8	10.3	3.5	6.5	21.4	59
2	.23	5.8	.19	4.1	1.2	30	4.2	12.1	4.0	9.1	24.3	70
3	.23	5.7	.18	3.9	1.2	29	4.4	12.2	3.8	8.4	23.8	67
4	.25	6.1	.17	3.6	1.2	29	4.8	12.9	3.7	8.0	24.2	65
5	.26	6.5	.16	3.5	1.2	29	4.7	13.7	3.3	7.7	22.6	65
6	.21	5.5	.19	4.1	1.2	31	3.6	11.4	4.2	8.9	24.0	75
7	.23	5.6	.18	4.0	1.2	29	4.4	12.0	3.8	8.5	23.8	65
8	.25	6.1	.17	3.6	1.2	29	4.8	13.1	3.4	7.8	23.4	64
CONTROL	.20	5.8	.10	2.6	.8	23	10.8	12.4	5.6	5.2	44.0	50

TREATMENT NUMBERS	TOTAL STEM VOLUME PER ACRE (CUBIC FEET)						CUMULATIVE YIELD [1]	
	PERIODIC ANNUAL GROWTH (1963-1965)		PERIODIC ANNUAL GROWTH (1965-1969)		TOTAL (1963-1969)		(1963-1965)	(1965-1969)
	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT		
1	63	13.7	78	14.2	439	96	586	899
2	56	12.5	100	17.4	512	113	564	963
3	71	16.0	87	15.1	490	110	588	935
4	72	14.8	91	14.8	507	105	629	993
5	69	16.4	77	14.1	446	106	560	866
6	53	12.2	117	19.0	573	132	542	1009
7	56	11.7	98	17.3	503	106	588	981
8	71	14.7	86	14.3	486	100	629	973
CONTROL	196	18.3	140	9.7	953	89	1463	2023

[1] Not included is an estimated 612 cubic feet which was removed during the calibration thinning.

TABLE 8A. GROSS PERIODIC ANNUAL GROWTH, WITH TOTAL GROWTH AND CUMULATIVE VOLUME YIELD, FOR ALL TREES, IN METRIC UNITS, BY TREATMENT, FROM BEGINNING TO END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK)

TREATMENT NUMBERS	QUADRATIC MEAN D.B.H. (CENTIMETERS)						BASAL AREA PER HECTARE (SQUARE METERS)					
	PERIODIC ANNUAL GROWTH (1963-1965)		PERIODIC ANNUAL GROWTH (1965-1969)		TOTAL (1963-1969)		PERIODIC ANNUAL GROWTH (1963-1965)		PERIODIC ANNUAL GROWTH (1965-1969)		TOTAL (1963-1969)	
	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT
1	.5	4.9	.5	3.9	2.8	27	.9	10.3	.8	8.5	4.9	59
2	.6	5.8	.5	4.1	3.1	30	1.0	12.1	.9	9.1	5.6	70
3	.6	5.7	.5	3.9	3.0	29	1.0	12.2	.9	8.4	5.5	67
4	.6	6.1	.4	3.6	3.0	29	1.1	12.9	.8	8.0	5.6	65
5	.7	6.5	.4	3.5	2.9	29	1.1	13.7	.8	7.7	5.2	65
6	.5	5.5	.5	4.1	3.0	31	.8	11.4	1.0	8.9	5.5	75
7	.6	5.6	.5	4.0	3.0	29	1.0	12.0	.9	8.5	5.5	65
8	.6	6.1	.4	3.6	3.0	29	1.1	13.1	.8	7.8	5.4	64
CONTROL	.5	5.8	.3	2.6	2.0	23	2.5	12.4	1.3	5.2	10.1	50

TREATMENT NUMBERS	TOTAL STEM VOLUME PER HECTARE (CUBIC METERS)						CUMULATIVE YIELD [1/]	
	PERIODIC ANNUAL GROWTH (1963-1965)		PERIODIC ANNUAL GROWTH (1965-1969)		TOTAL (1963-1969)		(1963-1965)	(1965-1969)
	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT		
1	4.4	13.7	5.5	14.2	30.7	96	41.0	62.9
2	3.9	12.5	7.0	17.4	35.8	113	39.4	67.4
3	5.0	16.0	6.1	15.1	34.3	110	41.1	65.5
4	5.0	14.8	6.4	14.8	35.5	105	44.0	69.5
5	4.8	16.4	5.4	14.1	31.2	106	39.2	60.8
6	3.7	12.2	8.2	19.0	40.1	132	37.9	70.6
7	3.9	11.7	6.9	17.3	35.2	106	41.2	68.6
8	5.0	14.7	6.0	14.3	34.0	100	44.0	68.1
CONTROL	13.7	18.3	9.8	9.7	66.7	89	102.4	141.6

[1/] Not included is an estimated 43 cubic meters which was removed during the calibration thinning.

TABLE 9. GROSS PERIODIC ANNUAL GROWTH, WITH CUMULATIVE VOLUME YIELD, IN ENGLISH UNITS, FOR ALL TREES, BY TREATMENT, FROM BEGINNING TO END OF CALIBRATION PERIOD: 1968 TO 1973

(STAMPEDE CREEK)

TREATMENT NUMBERS	QUADRATIC MEAN D.B.H. (INCHES)		BASAL AREA PER ACRE (SQUARE FEET)		TOTAL STEM VOLUME PER ACRE (CUBIC FEET)		
	PERIODIC ANNUAL GROWTH	PERCENT	PERIODIC ANNUAL GROWTH	PERCENT	PERIODIC ANNUAL GROWTH	PERCENT	CUMULATIVE YIELD 1/
1	.26	4.0	6.0	8.7	196	13.3	2456
2	.26	3.9	5.8	8.6	193	13.4	2405
3	.26	3.9	5.9	8.5	196	13.4	2440
4	.26	4.0	6.0	8.7	206	14.3	2467
5	.25	3.8	5.7	8.4	193	13.0	2452
6	.26	4.3	6.0	9.3	178	13.5	2209
7	.26	3.9	5.7	8.4	193	12.5	2511
8	.27	3.9	5.5	8.4	188	12.8	2402
CONTROL	.09	1.9	7.0	5.8	246	10.5	3577

1/ Not included is an estimated 896 cubic feet which was removed during the calibration thinning.

TABLE 9A. GROSS PERIODIC ANNUAL GROWTH, WITH CUMULATIVE VOLUME YIELD, IN METRIC UNITS, FOR ALL TREES, BY TREATMENT, FROM BEGINNING TO END OF CALIBRATION PERIOD: 1968 TO 1973

(STAMPEDE CREEK)

TREATMENT NUMBERS	QUADRATIC MEAN D.B.H. (CENTIMETERS)		BASAL AREA PER HECTARE (SQUARE METERS)		TOTAL STEM VOLUME PER HECTARE (CUBIC METERS)		
	PERIODIC ANNUAL GROWTH	PERCENT	PERIODIC ANNUAL GROWTH	PERCENT	PERIODIC ANNUAL GROWTH	PERCENT	CUMULATIVE YIELD 1/
1	.7	4.0	1.4	8.7	13.7	13.3	171.9
2	.7	3.9	1.3	8.6	13.5	13.4	168.3
3	.7	3.9	1.4	8.5	13.7	13.4	170.8
4	.7	4.0	1.4	8.7	14.4	14.3	172.6
5	.6	3.8	1.3	8.4	13.5	13.0	171.6
6	.7	4.3	1.4	9.3	12.5	13.5	154.6
7	.7	3.9	1.3	8.4	13.5	12.5	175.7
8	.7	3.9	1.3	8.4	13.1	12.8	168.1
CONTROL	.2	1.9	1.6	5.8	17.2	10.5	250.3

1/ Not included is an estimated 62 cubic meters which was removed during the calibration thinning.

TABLE 10. GROSS PERIODIC ANNUAL GROWTH, WITH TOTAL GROWTH AND CUMULATIVE VOLUME YIELD, FOR ALL TREES, IN ENGLISH UNITS, BY TREATMENT AND PERIODS: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK)

QUADRATIC MEAN D.B.H. (INCHES)

TREATMENT NUMBERS	PERIODIC ANNUAL GROWTH PERIODS				TOTAL	
	CALIBRATION (1966-1970)		1ST TREATMENT (1970-1973)		(1966-1973)	
	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT
1	.40	8.4	.46	7.0	3.0	63
2	.41	8.2	.48	6.9	3.1	62
3	.40	8.1	.45	5.7	2.9	60
4	.41	8.2	.45	6.5	3.0	60
5	.40	7.9	.43	6.3	2.9	57
6	.40	8.3	.43	6.6	2.9	60
7	.40	8.0	.41	6.1	2.8	56
8	.42	8.3	.43	6.3	3.0	59
CONTROL	.19	5.2	.18	4.0	1.3	36

BASAL AREA PER ACRE (SQUARE FEET)

TREATMENT NUMBERS	PERIODIC ANNUAL GROWTH PERIODS				TOTAL	
	CALIBRATION (1966-1970)		1ST TREATMENT (1970-1973)		(1966-1973)	
	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT
1	8.5	19.5	8.3	15.6	58.6	135
2	9.4	19.3	7.8	15.2	61.0	125
3	8.6	18.6	9.0	14.5	61.4	133
4	9.3	19.0	8.9	14.3	63.9	130
5	8.8	18.0	9.9	13.8	64.7	133
6	8.8	19.5	10.3	14.3	66.2	146
7	9.0	18.3	10.7	13.3	68.1	139
8	9.6	19.4	11.0	13.6	71.3	145
CONTROL	12.1	14.7	12.8	9.9	86.8	106

TOTAL STEM VOLUME PER ACRE (CUBIC FEET)

TREATMENT NUMBERS	PERIODIC ANNUAL GROWTH PERIODS				TOTAL	
	CALIBRATION (1966-1970)		1ST TREATMENT (1970-1973)		(1966-1973)	
	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT
1	197	32.9	216	22.4	1439	240
2	234	31.6	236	23.4	1644	224
3	213	32.4	246	21.4	1578	244
4	235	30.7	257	20.5	1710	224
5	218	29.8	293	21.2	1753	239
6	206	32.6	277	21.3	1656	263
7	221	30.2	331	21.6	1874	257
8	229	30.0	324	20.5	1876	246
CONTROL	336	27.5	405	17.5	2439	219

CUMULATIVE YIELD [1/]

TREATMENT NUMBERS	PERIODS	
	CALIBRATION (1966-1970)	1ST TREATMENT (1970-1973)
1	1389	2038
2	1669	2378
3	1487	2227
4	1703	2474
5	1606	2486
6	1454	2286
7	1613	2605
8	1678	2639
CONTROL	2335	3551

[1/] Not included is an estimated 412 cubic feet which was removed during the calibration thinning.

TABLE 10A. GROSS PERIODIC ANNUAL GROWTH, WITH TOTAL GROWTH AND CUMULATIVE VOLUME YIELD, FOR ALL TREES, IN METRIC UNITS, BY TREATMENT AND PERIODS: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK)

QUADRATIC MEAN D.B.H. (CENTIMETERS)

TREATMENT NUMBERS	PERIODIC ANNUAL GROWTH PERIODS				TOTAL	
	CALIBRATION (1966-1970)		1ST TREATMENT (1970-1973)		(1966-1973)	
	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT
1	1.0	8.4	1.2	7.0	7.6	63
2	1.0	8.2	1.2	6.9	7.8	62
3	1.0	8.1	1.1	6.7	7.5	60
4	1.0	8.2	1.1	6.5	7.6	60
5	1.0	7.9	1.1	6.3	7.3	57
6	1.0	8.3	1.1	6.6	7.3	60
7	1.0	8.0	1.0	6.1	7.2	56
8	1.1	8.3	1.1	6.3	7.5	59
CONTROL	.5	5.2	.5	4.0	3.3	36

BASAL AREA PER HECTARE (SQUARE METERS)

TREATMENT NUMBERS	PERIODIC ANNUAL GROWTH PERIODS				TOTAL	
	CALIBRATION (1966-1970)		1ST TREATMENT (1970-1973)		(1966-1973)	
	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT
1	1.9	19.5	1.9	15.6	13.4	135
2	2.2	19.3	1.8	15.2	14.0	125
3	2.0	18.6	2.1	14.5	14.1	133
4	2.1	19.0	2.0	14.3	14.7	130
5	2.0	18.0	2.3	13.8	14.8	133
6	2.0	19.5	2.4	14.3	15.2	146
7	2.1	18.3	2.5	13.3	15.6	139
8	2.2	19.4	2.5	13.6	16.4	145
CONTROL	2.8	14.7	2.9	9.9	19.9	106

TOTAL STEM VOLUME PER HECTARE (CUBIC METERS)

TREATMENT NUMBERS	PERIODIC ANNUAL GROWTH PERIODS				TOTAL	
	CALIBRATION (1966-1970)		1ST TREATMENT (1970-1973)		(1966-1973)	
	GROWTH	PERCENT	GROWTH	PERCENT	GROWTH	PERCENT
1	13.8	32.9	15.1	22.4	100.7	240
2	16.3	31.8	16.5	23.4	115.0	224
3	14.7	32.4	17.2	21.4	110.4	244
4	16.4	30.7	18.0	20.5	119.7	224
5	15.3	29.8	20.5	21.2	122.6	239
6	14.4	32.6	19.4	21.3	115.9	263
7	15.4	35.2	23.1	21.6	131.2	257
8	16.0	30.0	22.4	20.5	131.3	246
CONTROL	21.4	27.5	26.4	17.5	170.7	219

CUMULATIVE YIELD [1/]

TREATMENT NUMBERS	PERIODS	
	CALIBRATION (1966-1970)	1ST TREATMENT (1970-1973)
1	97.2	142.6
2	116.8	160.4
3	104.1	155.6
4	119.2	173.1
5	112.4	173.9
6	101.7	159.9
7	112.9	182.3
8	117.4	184.7
CONTROL	163.4	248.5

[1/] Not included is an estimated 29 cubic meters which was removed during the calibration thinning.

TABLE 11. GROSS PERIODIC ANNUAL GROWTH, WITH CUMULATIVE VOLUME YIELD, IN ENGLISH UNITS, FOR CROP TREES, BY TREATMENT, FROM BEGINNING TO END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK)

TREATMENT NUMBERS	QUADRATIC MEAN D.B.H. (INCHES)		BASAL AREA PER ACRE (SQUARE FEET)		TOTAL STEM VOLUME PER ACRE (CUBIC FEET)			
	PERIODIC ANNUAL GROWTH		PERIODIC ANNUAL GROWTH		PERIODIC ANNUAL GROWTH		CUMULATIVE YIELD	
	(1963-1965)	(1965-1969)	(1963-1965)	(1965-1969)	(1963-1965)	(1965-1969)	(1963-1965)	(1965-1969)
1	.23	.21	1.0	.9	17	23	157	247
2	.28	.23	1.2	1.2	19	32	171	299
3	.27	.20	1.2	1.0	17	24	171	267
4	.29	.18	1.3	.9	20	23	168	262
5	.31	.18	1.3	.8	20	22	157	246
6	.23	.24	.9	1.2	16	35	150	292
7	.27	.21	1.2	1.0	17	28	173	285
8	.29	.19	1.3	.9	19	25	177	277
CONTROL	.32	.17	1.6	1.0	29	26	236	342

TABLE 12. GROSS PERIODIC ANNUAL GROWTH, WITH CUMULATIVE VOLUME YIELD, IN ENGLISH UNITS, FOR CROP TREES, BY TREATMENT, FROM BEGINNING TO END OF CALIBRATION PERIOD: 1968 TO 1973

(STAMPEDE CREEK)

TREATMENT NUMBERS	QUADRATIC MEAN D.B.H. (INCHES) PERIODIC ANNUAL GROWTH	BASAL AREA PER ACRE (SQUARE FEET) PERIODIC ANNUAL GROWTH	TOTAL STEM VOLUME PER ACRE (CUBIC FEET)	
			PERIODIC ANNUAL GROWTH	CUMULATIVE YIELD
1	.33	2.7	94	1182
2	.35	3.0	108	1340
3	.33	2.7	97	1191
4	.35	2.8	104	1216
5	.35	3.0	117	1471
6	.35	2.7	85	1072
7	.34	2.7	99	1236
8	.36	3.1	118	1416
CONTROL	.29	2.4	93	1254

TABLE 13. GROSS PERIODIC ANNUAL GROWTH, WITH CUMULATIVE VOLUME YIELD, IN ENGLISH UNITS, FOR CROP TREES, BY TREATMENT AND PERIODS: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK)

TREATMENT NUMBERS	QUADRATIC MEAN D.B.H. (INCHES)		BASAL AREA PER ACRE (SQUARE FEET)		TOTAL STEM VOLUME PER ACRE (CUBIC FEET)			
	PERIODIC ANNUAL GROWTH PERIODS		PERIODIC ANNUAL GROWTH PERIODS		PERIODIC ANNUAL GROWTH PERIODS		CUMULATIVE YIELD PERIODS	
	CALIBRATION (1966-1970)	1ST TREATMENT (1970-1973)	CALIBRATION (1966-1970)	1ST TREATMENT (1970-1973)	CALIBRATION (1966-1970)	1ST TREATMENT (1970-1973)	CALIBRATION (1966-1970)	1ST TREATMENT (1970-1973)
1	.45	.51	2.5	3.6	62	100	449	749
2	.44	.51	2.6	3.8	69	116	514	864
3	.47	.49	2.8	3.6	71	101	512	817
4	.47	.49	2.8	3.7	76	109	555	882
5	.47	.49	2.9	3.7	76	116	563	911
6	.47	.50	2.7	3.6	65	101	466	770
7	.45	.45	2.5	3.2	63	103	468	776
8	.50	.49	3.0	3.6	76	111	550	884
CONTROL	.40	.39	2.2	2.6	61	86	459	717

TABLE 14. MEAN HEIGHT OF CROP TREES BY TREATMENT AND MEASUREMENT YEAR: 1963, 1965, AND 1969

(ROCKY BROOK)

TREATMENT NUMBERS	NUMBER TREES MEASURED			MEAN HEIGHT (FEET)		
	1963	1965	1969	1963	1965	1969
1	23	18	20	29.3	32.1	38.2
2	20	12	17	31.3	31.6	40.4
3	24	13	21	31.0	31.2	37.4
4	21	15	17	31.7	33.1	39.7
5	25	23	23	27.8	30.3	36.2
6	20	13	25	31.6	33.9	42.1
7	24	13	21	30.3	30.5	39.0
8	26	17	18	31.0	31.5	38.8
CONTROL	18	12	13	31.0	33.5	38.5
ALL TREATMENTS	201	136	175	30.5	31.9	36.9
STANDARD DEVIATION				1.23	1.20	1.70
COEFFICIENT OF VARIATION (PERCENT)				4.0	3.8	4.4
THINNED TREATMENTS ONLY	183	124	162	30.4	31.7	39.0

TABLE 15. MEAN HEIGHT OF CROP TREES, BY TREATMENT, AT BEGINNING AND END OF CALIBRATION PERIOD: 1968 AND 1973

(STAMPEDE CREEK)

TREATMENT NUMBERS	NUMBER TREES MEASURED		MEAN HEIGHT (FEET)	
	1968	1973	1968	1973
1	11	19	56.2	67.3
2	13	16	56.5	67.0
3	12	14	55.2	68.0
4	11	16	57.6	68.5
5	14	18	57.1	67.5
6	13	16	55.0	65.1
7	10	16	56.0	67.9
8	10	16	57.9	68.5
CONTROL	12	16	57.7	69.1
ALL TREATMENTS	106	147	56.5	67.6
STANDARD DEVIATION			1.01	1.09
COEFFICIENT OF VARIATION (PERCENT)			1.8	1.6
THINNED TREATMENTS ONLY	94	131	56.4	67.5

TABLE 16. MEAN HEIGHT OF CROP TREES BY TREATMENT AND MEASUREMENT YEARS 1966, 1970, AND 1973

(IRON CREEK)

TREATMENT NUMBERS	NUMBER TREES MEASURED			MEAN HEIGHT (FEET)		
	1966	1970	1973	1966	1970	1973
1	16	22	21	34.4	45.9	53.5
2	16	22	21	36.4	48.7	56.4
3	16	24	23	34.9	47.0	53.9
4	15	22	23	38.8	50.5	58.5
5	15	22	19	37.6	48.9	57.3
6	15	21	22	35.4	45.8	53.2
7	16	24	24	36.7	46.7	55.2
8	15	21	20	38.4	49.6	57.7
CONTROL	14	19	18	35.4	47.5	55.7
ALL TREATMENTS	138	197	191	36.4	47.8	55.7
STANDARD DEVIATION				1.47	1.58	1.83
COEFFICIENT OF VARIATION (PERCENT)				4.0	3.3	3.3
THINNED TREATMENTS ONLY	124	178	173	36.6	47.9	55.7

TABLE 17. STAND DATA FOR ALL LIVE TREES IN ENGLISH UNITS, BY TREATMENT, AT BEGINNING AND END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK)

TREATMENT NUMBERS	NUMBER TREES PER ACRE (ROUNDED TO NEAREST WHOLE TREE)				QUADRATIC MEAN D.B.H. (INCHES)				BASAL AREA PER ACRE (SQUARE FEET)				TOTAL STEM VOLUME PER ACRE (CUBIC FEET)			
	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969
1	400	360	360	355	4.1	4.6	4.6	5.3	36.5	41.1	41.1	54.6	460	552	552	859
2	398	357	375	363	4.0	4.6	4.6	5.4	34.8	40.3	43.6	58.2	451	530	573	952
3	400	367	395	383	4.1	4.6	4.6	5.3	35.8	42.6	45.1	59.4	446	564	575	911
4	400	383	383	368	4.1	4.7	4.7	5.4	37.2	45.6	45.6	58.8	485	615	615	957
5	400	378	378	370	4.0	4.6	4.6	5.2	34.5	42.6	42.6	55.1	422	545	545	846
6	397	335	400	390	3.8	4.4	4.7	5.4	32.0	35.2	47.1	63.2	436	494	613	1072
7	400	338	398	388	4.1	4.7	4.5	5.3	36.4	41.2	44.3	58.7	477	544	567	951
8	400	368	368	367	4.1	4.7	4.7	5.4	36.8	44.2	44.2	57.9	487	602	602	943
CONTROL	1367	1335	1335	1317	3.4	3.8	3.8	4.2	87.2	107.2	107.2	129.0	1070	1443	1443	1996

TABLE 17A. STAND DATA FOR ALL LIVE TREES IN METRIC UNITS, BY TREATMENT, AT BEGINNING AND END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK)

TREATMENT NUMBERS	NUMBER TREES PER HECTARE (ROUNDED TO NEAREST WHOLE TREE)				QUADRATIC MEAN D.B.H. (CENTIMETERS)				BASAL AREA PER HECTARE (SQUARE METERS)				TOTAL STEM VOLUME PER HECTARE (CUBIC METERS)			
	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969
1	988	890	890	877	10.4	11.6	11.6	13.5	8.4	9.4	9.4	12.5	32	39	39	60
2	984	881	927	898	10.2	11.6	11.7	13.8	8.0	9.2	10.0	13.4	32	37	40	67
3	988	906	976	947	10.3	11.7	11.6	13.5	8.2	9.8	10.4	13.6	31	39	40	64
4	988	947	947	910	10.5	11.9	11.9	13.7	8.5	10.5	10.5	13.5	34	43	43	67
5	988	935	935	914	10.1	11.6	11.6	13.3	7.9	9.8	9.8	12.7	30	38	38	59
6	980	828	988	964	9.8	11.2	11.8	13.8	7.3	8.1	10.8	14.5	30	35	43	75
7	988	836	984	960	10.4	12.0	11.5	13.4	8.4	9.5	10.2	13.5	33	38	40	67
8	988	910	910	906	10.4	11.9	11.9	13.7	8.5	10.2	10.2	13.3	34	42	42	66
CONTROL	3377	3299	3299	3254	8.7	9.8	9.8	10.8	20.0	24.6	24.6	29.6	75	101	101	140

TABLE 18. STAND DATA FOR ALL LIVE TREES IN ENGLISH UNITS, BY TREATMENT, AT BEGINNING AND END OF CALIBRATION PERIOD: 1968 AND 1973

(STAMPEDE CREEK)

TREATMENT NUMBERS	NUMBER TREES PER ACRE 1/		QUADRATIC MEAN D.B.H. (INCHES)		BASAL AREA PER ACRE (SQUARE FEET)		TOTAL STEM VOLUME PER ACRE (CUBIC FEET)	
	START 1968	END 1973	START 1968	END 1973	START 1968	END 1973	START 1968	END 1973
1	293	292	6.6	7.9	68.7	98.4	1475	2448
2	285	282	6.6	7.9	67.4	95.8	1439	2387
3	287	285	6.7	8.0	69.4	98.5	1462	2433
4	293	283	6.6	7.9	69.2	97.3	1439	2428
5	282	280	6.7	7.9	68.1	96.5	1485	2450
6	320	315	6.1	7.4	64.7	94.0	1318	2196
7	278	275	6.7	8.1	68.8	97.2	1544	2504
8	252	250	6.9	8.3	66.1	93.7	1464	2401
CONTROL	995	1005	4.7	5.3	118.9	151.6	2349	3548

1/ Rounded to nearest whole tree.

TABLE 18A. STAND DATA FOR ALL LIVE TREES IN METRIC UNITS, BY TREATMENT, AT BEGINNING AND END OF CALIBRATION PERIOD: 1968 AND 1973

(STAMPEDE CREEK)

TREATMENT NUMBERS	NUMBER TREES PER HECTARE 1/		QUADRATIC MEAN D.B.H. (CENTIMETERS)		BASAL AREA PER HECTARE (SQUARE METERS)		TOTAL STEM VOLUME PER HECTARE (CUBIC METERS)	
	START 1968	END 1973	START 1968	END 1973	START 1968	END 1973	START 1968	END 1973
1	725	721	16.6	20.0	15.8	22.6	103	171
2	704	696	16.7	20.1	15.5	22.0	101	167
3	708	704	16.9	20.2	15.9	22.6	102	170
4	725	700	16.7	20.2	15.9	22.3	101	170
5	696	692	16.9	20.2	15.6	22.1	104	171
6	791	778	15.5	18.8	14.8	21.6	92	154
7	688	680	17.1	20.4	15.8	22.3	108	175
8	622	618	17.6	21.1	15.2	21.5	102	168
CONTROL	2459	2483	11.9	13.4	27.3	34.8	164	248

1/ Rounded to nearest whole tree.

TABLE 19. STAND DATA FOR ALL LIVE TREES IN ENGLISH UNITS, BY TREATMENT, AT BEGINNING AND END OF PERIODS: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK)

TREATMENT NUMBERS	NUMBER TREES PER ACRE (ROUNDED TO NEAREST WHOLE TREE)				QUADRATIC MEAN D.B.H. (INCHES)				BASAL AREA PER ACRE (SQUARE FEET)				TOTAL STEM VOLUME PER ACRE (CUBIC FEET)			
	PERIODS				PERIODS				PERIODS				PERIODS			
	CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT	
	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973
1	355	343	223	205	4.7	6.4	6.6	8.1	43.4	76.0	52.9	73.3	600	1370	964	1529
2	358	343	195	185	5.0	6.7	6.9	8.4	48.7	84.2	51.4	71.6	734	1634	1009	1646
3	348	340	248	237	4.9	6.6	6.8	8.2	46.3	79.9	61.9	86.1	648	1474	1151	1834
4	357	348	237	222	5.0	6.7	6.9	8.4	49.0	85.2	62.3	85.1	764	1686	1254	1938
5	347	338	277	273	5.1	6.7	6.9	8.2	48.6	82.6	71.3	99.7	733	1588	1383	2236
6	360	343	307	295	4.8	6.5	6.6	7.9	45.4	79.0	71.9	100.0	629	1428	1303	2085
7	358	345	332	317	5.0	6.7	6.7	7.9	49.0	83.4	80.4	108.9	731	1584	1528	2441
8	352	345	313	288	5.1	6.8	6.9	8.2	49.2	86.7	80.9	105.9	763	1667	1562	2352
CONTROL	1125	1190	1190	1185	3.7	4.5	4.5	5.1	62.2	129.5	129.5	164.7	1112	2321	2321	3469

TABLE 19A. STAND DATA FOR ALL LIVE TREES IN METRIC UNITS, BY TREATMENT, AT BEGINNING AND END OF PERIODS: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK)

TREATMENT NUMBERS	NUMBER TREES PER HECTARE (ROUNDED TO NEAREST WHOLE TREE)				QUADRATIC MEAN D.B.H. (CENTIMETERS)				BASAL AREA PER HECTARE (SQUARE METERS)				TOTAL STEM VOLUME PER HECTARE (CUBIC METERS)			
	PERIODS				PERIODS				PERIODS				PERIODS			
	CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT	
	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973
1	877	848	552	507	12.0	16.2	16.7	20.6	10.0	17.5	12.1	16.8	42	96	67	107
2	885	848	482	457	12.7	17.0	17.7	21.4	11.2	19.3	11.8	16.4	51	114	71	115
3	861	840	614	585	12.5	16.7	17.2	20.7	10.6	18.3	14.2	19.8	45	103	81	128
4	881	861	585	548	12.8	17.0	17.7	21.3	11.3	19.6	14.3	19.5	53	118	88	136
5	857	836	684	675	12.9	17.0	17.5	20.8	11.2	19.0	16.4	22.9	51	111	97	156
6	890	848	758	729	12.2	16.5	16.6	20.1	10.4	18.1	16.5	23.0	44	100	91	146
7	885	853	820	782	12.7	16.9	16.9	20.2	11.3	19.1	18.5	25.0	51	111	107	171
8	869	853	774	712	12.9	17.2	17.5	20.9	11.3	19.9	18.6	24.3	53	117	109	165
CONTROL	2780	2941	2941	2928	9.3	11.4	11.4	12.8	18.9	29.7	29.7	37.8	78	162	162	243

TABLE 20. STAND DATA FOR CROP TREES, BY TREATMENT AND PLOT, AT BEGINNING AND END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK)

TREATMENT AND PLOT NUMBERS		NUMBER TREES PER ACRE				QUADRATIC MEAN D.B.H. (INCHES)				BASAL AREA PER ACRE (SQUARE FEET)				TOTAL STEM VOLUME PER ACRE (CUBIC FEET)			
		START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969
1:	024	80	80	80	80	4.3	4.8	4.8	5.5	8.1	10.1	10.1	13.3	94	122	122	192
	032	75	65	65	60	4.4	5.1	5.1	6.1	7.9	9.2	9.2	12.1	105	125	125	195
	036	80	75	75	75	5.3	5.7	5.7	6.7	12.0	13.3	13.3	18.1	169	210	210	333
2:	006	80	75			4.6	5.0			9.4	10.4			128	140		
	020	75	75	75	75	4.7	5.4	5.4	6.2	9.0	11.8	11.8	15.7	113	158	158	252
	030	80	75	75	75	5.0	5.8	5.8	6.6	11.0	13.5	13.5	17.6	161	205	205	309
	044			60	75			5.6	6.9			13.8	19.4			195	375
3:	011	80	80	80	80	5.0	5.5	5.5	6.3	10.7	13.3	13.3	17.5	147	188	188	289
	016	80	80	80	80	4.6	5.2	5.2	5.9	9.4	11.6	11.6	15.2	128	158	158	241
	031	80	70			4.7	5.4			9.5	11.1			135	157		
	040			80	80			5.4	6.2			12.6	16.5			160	265
4:	010	80	80	80	80	4.7	5.3	5.3	6.1	9.7	12.4	12.4	16.4	125	169	169	267
	013	80	80	80	80	4.4	5.0	5.0	5.6	8.6	10.9	10.9	13.7	110	143	143	214
	019	80	75	75	70	4.8	5.5	5.5	6.3	10.2	12.3	12.3	15.3	151	185	185	285
5:	009	80	75	75	75	4.4	5.1	5.1	5.7	8.6	10.5	10.5	13.3	106	140	140	210
	015	80	75	75	75	4.5	5.1	5.1	5.8	8.9	10.8	10.8	13.8	112	145	145	226
	021	80	75	75	75	4.7	5.6	5.6	6.4	9.8	12.7	12.7	16.9	130	173	173	287
6:	008	80	75			4.4	4.8			8.5	9.5			120	143		
	033	80	45			4.3	5.4			8.1	7.2			113	108		
	034	80	70			4.4	5.2			8.5	10.1			122	152		
	041			60	80			5.7	6.7			14.0	19.5			211	368
	042			60	80			5.1	6.0			11.5	15.6			147	268
	043	63	80	80	80	5.1	5.4	6.4	6.5	8.9	13.0	17.8	18.4	134	181	322	331
7:	003	80	75			4.8	5.3			9.9	11.7			135	166		
	025	80	75	75	70	4.5	5.2	5.2	6.0	8.8	10.9	10.9	13.9	114	142	142	222
	035	80	65			5.1	5.9			11.4	12.2			167	180		
	038			80	80			4.8	5.8			10.2	14.4			133	252
	039			80	80			5.5	6.3			13.1	17.4			189	322
8:	012	80	75	75	75	4.5	5.1	5.1	5.8	8.9	10.6	10.6	13.6	120	146	146	218
	023	80	75	75	70	5.0	5.7	5.7	6.7	10.8	13.3	13.3	17.2	156	203	203	326
	028	80	75	75	75	4.8	5.4	5.4	6.2	9.9	12.1	12.1	15.8	138	166	166	264
CONTROL:	014	80	80	80	80	4.5	5.0	5.0	5.6	8.8	11.1	11.1	13.5	114	154	154	211
	027	80	80	80	80	6.1	6.8	6.8	7.8	16.5	20.4	20.4	26.4	258	340	340	506
	029	80	80	80	80	5.3	5.9	5.9	6.5	12.0	15.2	15.2	18.2	163	215	215	309

TABLE 21. STAND DATA FOR CROP TREES, BY TREATMENT AND PLOT, AT BEGINNING AND END OF CALIBRATION PERIOD: 1968 AND 1973

(STAMPEDE CREEK)

TREATMENT AND PLOT NUMBERS		NUMBER TREES PER ACRE		QUADRATIC MEAN D.B.H. (INCHES)		BASAL AREA PER ACRE (SQUARE FEET)		TOTAL STEM VOLUME PER ACRE (CUBIC FEET)	
		START 1968	END 1973	START 1968	END 1973	START 1968	END 1973	START 1968	END 1973
1:	041	80	80	7.9	9.6	27.3	40.5	648	1116
	072	80	80	8.7	10.4	33.0	47.6	797	1249
	126	80	80	8.3	9.8	29.9	42.0	692	1182
2:	091	80	80	8.6	10.1	31.9	44.7	716	1195
	112	80	80	8.4	10.2	30.4	45.0	707	1232
	113	80	80	9.5	11.4	39.3	56.2	983	1594
3:	051	80	80	8.7	10.3	32.8	46.6	781	1318
	103	80	80	8.3	10.0	30.1	43.5	670	1160
	121	80	80	8.2	9.8	29.1	41.6	665	1097
4:	071	80	80	8.5	10.4	31.7	47.2	719	1296
	082	80	80	7.9	9.6	27.1	39.8	609	1031
	115	80	80	8.6	10.2	32.3	45.9	754	1322
5:	092	80	80	9.2	11.1	37.1	53.7	945	1572
	114	80	80	9.2	10.9	36.8	51.6	880	1449
	125	80	80	8.9	10.5	34.8	48.4	832	1394
6:	032	80	80	7.8	9.4	26.4	38.7	610	994
	101	80	80	8.5	10.4	31.8	46.6	766	1217
	102	80	80	7.7	9.4	25.8	38.9	560	1005
7:	062	80	80	8.6	10.4	32.5	47.6	757	1347
	106	80	80	8.4	10.1	31.0	44.8	735	1234
	107	80	80	8.1	9.7	29.0	40.8	728	1127
8:	096	80	80	9.3	11.1	37.7	53.7	891	1596
	111	80	80	8.9	10.9	34.6	51.4	855	1391
	116	80	80	8.5	10.1	31.6	44.7	735	1260
CONTROL:	061	80	80	8.3	9.8	30.3	41.9	727	1176
	105	80	80	8.8	10.2	33.6	45.3	809	1260
	122	80	80	9.0	10.4	35.1	47.0	834	1325

TABLE 22. STAND DATA FOR CROP TREES, BY TREATMENT AND PLOT, AT BEGINNING AND END OF PERIODS: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK)

TREATMENT AND PLOT NUMBERS		NUMBER TREES PER ACRE				QUADRATIC MEAN D.B.H. (INCHES)				BASAL AREA PER ACRE (SQUARE FEET)				TOTAL STEM VOLUME PER ACRE (CUBIC FEET)			
		PERIODS				PERIODS				PERIODS				PERIODS			
		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT	
		START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973
1:	021	80	80	80	80	5.8	7.7	7.7	9.3	14.8	25.5	25.5	37.8	214	472	472	802
	033	80	80	80	65	5.3	7.1	7.1	8.9	12.5	22.2	22.2	28.4	193	434	434	652
	051	80	70	75	70	5.6	7.6	7.5	9.2	13.6	22.1	23.2	32.2	192	413	432	685
2:	082	80	80	80	75	5.8	7.7	7.7	9.3	14.9	25.5	25.5	35.2	239	523	523	902
	091	80	75	80	65	5.6	7.4	7.3	9.0	13.5	22.2	23.5	28.5	208	444	469	641
	101	80	75	60	80	6.1	8.0	7.9	9.6	16.3	26.3	27.6	40.1	268	543	568	913
3:	031	80	80	80	80	5.7	7.4	7.4	8.8	14.1	23.8	23.8	33.9	209	440	440	745
	042	80	80	80	75	6.2	8.1	8.1	9.6	16.7	28.8	28.8	37.8	249	577	577	833
	052	80	80	80	80	5.8	7.8	7.8	9.3	15.0	26.5	26.3	37.5	224	520	516	814
4:	013	80	80	80	75	6.3	8.2	8.2	9.8	17.2	29.4	29.4	39.1	287	602	602	905
	062	80	75	80	80	5.4	7.3	7.3	8.7	12.8	22.1	23.0	33.2	195	451	466	717
	111	80	80	80	70	6.0	7.9	7.9	9.5	15.7	27.3	27.3	34.1	276	603	603	878
5:	012	80	80	80	80	6.1	8.0	8.1	9.7	16.0	27.7	28.6	40.7	260	563	584	966
	041	80	80	80	80	6.5	8.3	8.3	9.9	18.2	30.2	30.2	42.6	294	627	627	1017
	072	80	80	80	75	5.8	7.6	7.6	9.0	14.4	25.5	25.5	32.9	221	499	499	741
6:	015	80	75	80	80	5.7	7.6	7.4	8.9	14.0	23.4	24.2	34.8	214	443	456	744
	043	80	80	80	80	5.8	7.6	7.6	9.1	14.5	25.3	25.3	36.0	204	466	466	751
	081	80	80	80	80	5.6	7.5	7.5	9.1	13.6	24.8	24.8	35.8	203	478	478	811
7:	011	80	80	80	80	5.9	7.7	7.7	9.1	15.1	25.7	25.7	36.3	231	493	493	834
	023	80	80	80	75	5.6	7.4	7.4	8.7	13.7	24.1	24.1	31.2	206	467	467	698
	063	75	70	80	65	5.6	7.5	7.4	9.1	13.0	21.3	23.7	29.5	215	420	465	699
8:	014	75	70	75	70	6.1	8.3	8.2	9.9	15.4	26.2	27.5	37.7	251	518	544	869
	053	80	80	80	65	5.7	7.7	7.7	9.3	14.3	25.8	25.8	30.3	217	515	515	689
	073	80	80	80	70	6.1	8.1	8.1	9.7	16.0	28.3	28.3	35.9	274	601	601	881
CONTROL:	022	80	80	80	80	5.9	7.3	7.3	8.4	15.0	23.1	23.1	30.7	222	454	454	707
	025	80	80	80	80	5.8	7.4	7.4	8.6	14.4	23.8	23.8	32.1	214	460	460	723
	071	75	75	75	70	5.8	7.5	7.5	8.5	13.8	23.1	23.1	27.3	209	464	464	633

TABLE 23. NUMBER TREES PER ACRE, BY D.B.H. CLASS, FOR TREATMENTS 1, 2, 3, AND 4, FROM BEGINNING TO END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK AREA. NUMBERS ROUNDED TO NEAREST WHOLE TREE)

D.B.H. CLASS (INCHES)	TREATMENT 1				TREATMENT 2				TREATMENT 3				TREATMENT 4			
	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969
1.6 - 2.5	13	0	0	0	15	3	8	0	17	0	3	2	22	0	0	0
2.6 - 3.5	125	63	63	13	153	68	77	23	118	68	73	18	118	88	88	32
3.6 - 4.5	153	137	137	98	140	145	127	118	167	132	148	92	145	110	110	83
4.6 - 5.5	90	112	112	110	65	88	98	83	83	115	108	130	83	113	113	105
5.6 - 6.5	18	42	42	95	23	35	43	75	10	45	53	68	27	53	53	95
6.6 - 7.5	0	7	7	32	2	15	20	33	5	5	8	45	5	15	15	35
7.6 - 8.5	0	0	0	7	0	2	2	27	0	2	0	7	0	3	3	13
8.6 - 9.5	0	0	0	0	0	0	0	3	0	0	0	2	0	0	0	5
TOTAL	400	360	360	355	398	357	375	363	400	367	395	383	400	383	383	368

TABLE 24. NUMBER TREES PER ACRE, BY D.B.H. CLASS, FOR TREATMENTS 5, 6, 7, AND 8, FROM BEGINNING TO END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK AREA. NUMBERS ROUNDED TO NEAREST WHOLE TREE)

D.B.H. CLASS (INCHES)	TREATMENT 5				TREATMENT 6				TREATMENT 7				TREATMENT 8			
	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969	START 1963	END 1965	START 1965	END 1969
1.6 - 2.5	23	2	2	0	18	5	7	0	13	0	10	0	18	0	0	0
2.6 - 3.5	128	63	63	23	163	82	77	33	128	58	75	22	120	77	77	30
3.6 - 4.5	157	162	162	107	147	115	142	92	162	102	142	105	148	117	117	87
4.6 - 5.5	78	103	103	128	62	98	100	112	72	125	122	130	88	100	100	113
5.6 - 6.5	13	40	40	68	7	32	60	82	23	38	42	87	23	53	53	80
6.6 - 7.5	0	8	8	35	0	3	13	53	0	13	8	35	2	22	22	40
7.6 - 8.5	0	0	0	8	0	0	2	10	0	0	0	8	0	0	0	17
8.6 - 9.5	0	0	0	0	0	0	0	8	2	2	0	2	0	0	0	0
TOTAL	400	378	378	370	397	335	400	390	400	338	398	368	400	368	368	367

TABLE 25. NUMBER TREES PER ACRE, BY D.B.H. CLASS, FOR CONTROL PLOTS, FROM BEGINNING TO END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK AREA. NUMBERS ROUNDED TO NEAREST WHOLE TREE)

D.B.H. CLASS (INCHES)	TWO PARTS OF CALIBRATION PERIOD			
	START 1963	END 1965	START 1965	END 1969
1.6 - 2.5	505	362	362	263
2.6 - 3.5	425	435	435	392
3.6 - 4.5	233	245	245	273
4.6 - 5.5	130	152	152	182
5.6 - 6.5	57	95	95	95
6.6 - 7.5	13	32	32	73
7.6 - 8.5	3	13	13	27
8.6 - 9.5	0	2	2	10
9.6 -10.5	0	0	0	2
TOTAL	1367	1335	1335	1317

TABLE 26. NUMBER TREES PER ACRE, BY D.B.H. CLASS AND TREATMENT NUMBER, AT BEGINNING AND END OF CALIBRATION PERIOD: 1968 AND 1973

(STAMPEDE CREEK AREA. NUMBERS ROUNDED TO NEAREST WHOLE TREE)

D.B.H. CLASS (INCHES)	TREATMENTS 1 START 1968	1 END 1973	2 START 1968	2 END 1973	3 START 1968	3 END 1973	4 START 1968	4 END 1973	5 START 1968	5 END 1973	6 START 1968	6 END 1973	7 START 1968	7 END 1973	8 START 1968	8 END 1973	CONTROL START 1968	CONTROL END 1973
1.6 - 2.5	2	0	2	0	0	0	3	0	7	0	0	0	3	0	5	0	343	318
2.6 - 3.5	18	13	33	12	13	5	20	12	18	13	33	7	12	7	28	12	162	168
3.6 - 4.5	38	22	52	28	40	20	28	17	47	22	67	35	25	18	13	18	133	107
4.6 - 5.5	48	25	42	43	42	33	48	20	55	40	52	50	45	25	32	22	93	100
5.6 - 6.5	48	42	43	48	50	33	62	40	40	47	62	52	57	32	38	32	92	72
6.6 - 7.5	65	37	42	30	73	38	52	58	45	32	48	45	63	37	58	25	78	67
7.6 - 8.5	42	50	27	33	30	55	48	38	28	37	38	40	38	58	33	47	45	72
8.6 - 9.5	23	48	18	20	28	48	23	32	13	37	10	43	18	52	20	32	30	45
9.6 -10.5	5	35	13	28	8	17	8	38	10	12	5	23	8	18	13	20	12	32
10.6 -11.5	2	12	5	13	0	27	0	20	13	18	2	12	8	12	7	22	3	17
11.6 -12.5	2	3	5	12	2	7	0	8	3	10	3	3	0	8	3	12	2	3
12.6 -13.5	0	3	2	5	0	0	0	0	2	8	0	2	0	8	0	7	2	3
13.6 -14.5	0	2	2	5	0	2	0	0	0	2	0	3	0	0	0	3	0	0
14.6 -15.5	0	0	0	2	0	0	0	0	0	3	0	0	0	0	0	0	0	2
15.6 -16.5	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	293	292	285	282	287	285	293	283	282	280	320	315	278	275	252	250	995	1005

TABLE 27. NUMBER TREES PER ACRE, BY D.B.H. CLASS, FOR TREATMENTS 1, 2, 3, AND 4, AT BEGINNING AND END OF EACH TREATMENT PERIOD: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK AREA. NUMBERS ROUNDED TO NEAREST WHOLE TREE)

D.B.H. CLASS (INCHES)	TREATMENT 1				TREATMENT 2				TREATMENT 3				TREATMENT 4			
	PERIODS				PERIODS				PERIODS				PERIODS			
	CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT	
	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973
1.6 - 2.5	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
2.6 - 3.5	62	0	0	0	32	0	0	0	47	5	3	0	43	0	0	0
3.6 - 4.5	103	40	18	3	100	15	5	0	83	33	17	3	100	25	12	2
4.6 - 5.5	123	68	37	10	132	60	18	5	130	43	35	13	110	55	30	10
5.6 - 6.5	48	95	62	30	73	92	48	12	72	110	67	27	77	95	58	18
6.6 - 7.5	18	92	63	38	22	95	68	30	13	73	57	37	25	88	63	37
7.6 - 8.5	0	30	28	48	0	67	48	53	2	58	55	63	2	60	52	55
8.6 - 9.5	0	15	12	43	0	15	7	52	0	13	12	53	0	22	18	58
9.6 -10.5	0	3	3	22	0	0	0	30	0	3	3	32	0	3	3	32
10.6 -11.5	0	0	0	7	0	0	0	3	0	0	0	7	0	0	0	10
11.6 -12.5	0	0	0	3	0	0	0	0	0	0	0	2	0	0	0	0
TOTAL	355	343	223	205	358	343	195	185	348	340	248	237	357	348	237	222

TABLE 28. NUMBER TREES PER ACRE, BY D.B.H. CLASS, FOR TREATMENTS 5, 6, 7, AND 8 AT BEGINNING AND END OF EACH TREATMENT PERIOD: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK AREA. NUMBERS ROUNDED TO NEAREST WHOLE TREE)

D.B.H. CLASS (INCHES)	TREATMENT 5				TREATMENT 6				TREATMENT 7				TREATMENT 8			
	PERIODS				PERIODS				PERIODS				PERIODS			
	CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT	
	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973
1.6 - 2.5	2	0	0	0	2	0	0	3	0	0	0	0	0	0	0	0
2.6 - 3.5	35	5	2	2	45	2	2	0	38	0	0	0	45	2	0	0
3.6 - 4.5	88	22	12	3	125	17	13	2	93	23	23	3	80	27	17	0
4.6 - 5.5	115	45	33	8	115	78	67	15	130	60	57	23	128	60	55	25
5.6 - 6.5	75	93	75	30	63	92	80	57	77	78	73	53	77	65	62	40
6.6 - 7.5	28	100	83	67	10	95	88	60	15	115	112	57	20	95	88	52
7.6 - 8.5	3	45	43	58	0	50	47	67	5	52	50	77	2	68	65	43
8.6 - 9.5	0	23	23	58	0	10	10	62	0	8	8	60	0	27	25	77
9.6 -10.5	0	5	5	35	0	0	0	27	0	8	8	33	0	2	2	33
10.6 -11.5	0	0	0	10	0	0	0	7	0	0	0	7	0	0	0	18
11.6 -12.5	0	0	0	2	0	0	0	0	0	0	0	3	0	0	0	0
TOTAL	347	338	277	273	360	343	307	295	358	345	332	317	352	345	313	288

TABLE 29. NUMBER TREES PER ACRE, BY D.B.H. CLASS, FOR CONTROL PLOTS, AT BEGINNING AND END OF EACH TREATMENT PERIOD: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK AREA. NUMBERS ROUNDED TO NEAREST WHOLE TREE)

D.B.H. CLASS (INCHES)	PERIODS: CALIBRATION START 1966	CALIBRATION END 1970	1ST TREATMENT START 1970	1ST TREATMENT END 1973
1.6 - 2.5	407	320	320	305
2.6 - 3.5	228	223	223	182
3.6 - 4.5	245	178	178	148
4.6 - 5.5	175	197	197	145
5.6 - 6.5	53	138	138	152
6.6 - 7.5	15	93	93	127
7.6 - 8.5	2	28	28	82
8.6 - 9.5	0	10	10	32
9.6 -10.5	0	2	2	12
10.6 -11.5	0	0	0	2
TOTAL	1125	1190	1190	1185

TABLE 30. STAND DATA FOR CROP TREES IN ENGLISH UNITS, BY TREATMENT, AT BEGINNING AND END OF TWO PARTS OF CALIBRATION PERIOD: 1963 TO 1965 AND 1965 TO 1969

(ROCKY BROOK)

TREATMENT NUMBERS	NUMBER TREES PER ACRE (ROUNDED TO NEAREST WHOLE TREE) START 1963	NUMBER TREES PER ACRE END 1965	NUMBER TREES PER ACRE START 1965	NUMBER TREES PER ACRE END 1969	QUADRATIC MEAN D.B.H. (INCHES) START 1963	QUADRATIC MEAN D.B.H. END 1965	QUADRATIC MEAN D.B.H. START 1965	QUADRATIC MEAN D.B.H. END 1969	BASAL AREA PER ACRE (SQUARE FEET) START 1963	BASAL AREA PER ACRE END 1965	BASAL AREA PER ACRE START 1965	BASAL AREA PER ACRE END 1969	TOTAL STEM VOLUME PER ACRE (CUBIC FEET) START 1963	TOTAL STEM VOLUME PER ACRE END 1965	TOTAL STEM VOLUME PER ACRE START 1965	TOTAL STEM VOLUME PER ACRE END 1969
1	78	73	73	72	4.7	5.2	5.2	6.1	9.3	10.9	10.9	14.5	123	152	152	240
2	78	75	77	75	4.8	5.4	5.6	6.6	9.8	11.9	13.0	17.6	134	168	186	312
3	80	77	80	80	4.8	5.4	5.3	6.1	9.9	12.0	12.5	16.4	137	167	168	265
4	80	78	78	77	4.7	5.3	5.3	6.0	9.5	11.8	11.8	15.1	129	166	166	255
5	80	75	75	75	4.6	5.3	5.3	6.0	9.1	11.3	11.3	14.7	116	153	153	241
6	80	63	80	80	4.4	5.1	5.4	6.4	8.3	8.9	13.0	17.8	118	134	151	322
7	80	72	78	77	4.8	5.4	5.2	6.0	10.0	11.6	11.4	15.2	139	162	155	265
8	80	75	75	73	4.8	5.4	5.4	6.2	9.9	12.0	12.0	15.5	138	172	172	270
CONTROL	80	80	80	80	5.3	6.0	6.0	6.7	12.4	15.6	15.6	19.4	178	236	236	342

TABLE 31. STAND DATA FOR CROP TREES IN ENGLISH UNITS, BY TREATMENT, AT BEGINNING AND END OF CALIBRATION PERIOD: 1968 AND 1973

(STAMPEDE CREEK)

TREATMENT NUMBERS	NUMBER TREES PER ACRE 1/		QUADRATIC MEAN D.B.H. (INCHES)		BASAL AREA PER ACRE (SQUARE FEET)		TOTAL STEM VOLUME PER ACRE (CUBIC FEET)	
	START 1968	END 1973	START 1966	END 1973	START 1968	END 1973	START 1968	END 1973
1	80	80	8.3	10.0	30.0	43.4	713	1182
2	80	80	8.8	10.6	33.9	48.6	802	1340
3	80	80	8.4	10.0	30.6	43.9	705	1191
4	80	80	8.3	10.1	30.3	44.3	694	1216
5	80	80	9.1	10.8	36.2	51.2	885	1471
6	80	80	8.0	9.8	28.0	41.4	645	1072
7	80	80	8.4	10.1	30.8	44.4	740	1236
8	80	80	8.9	10.7	34.6	49.9	827	1416
CONTROL	80	80	8.7	10.1	33.0	44.8	790	1254

1/ Rounded to nearest whole tree.

TABLE 32. STAND DATA FOR CROP TREES IN ENGLISH UNITS, BY TREATMENT, AT BEGINNING AND END OF PERIODS: 1966 TO 1970 AND 1970 TO 1973

(IRON CREEK)

TREATMENT NUMBERS	NUMBER TREES PER ACRE (ROUNDED TO NEAREST WHOLE TREE)				QUADRATIC MEAN D.B.H. (INCHES)				BASAL AREA PER ACRE (SQUARE FEET)				TOTAL STEM VOLUME PER ACRE (CUBIC FEET)			
	PERIODS				PERIODS				PERIODS				PERIODS			
	CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT		CALIBRATION		1ST TREATMENT	
	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973	START 1966	END 1970	START 1970	END 1973
1	80	77	76	72	5.6	7.5	7.4	9.2	13.6	23.3	23.7	32.8	200	440	446	713
2	80	77	80	73	5.8	7.7	7.7	9.3	14.9	24.7	25.5	34.6	238	503	520	819
3	80	80	80	76	5.9	7.8	7.8	9.2	15.2	26.4	26.3	36.4	227	512	511	797
4	80	78	80	75	5.9	7.8	7.8	9.3	15.2	26.3	26.6	35.5	253	552	557	833
5	80	80	80	78	6.1	8.0	8.0	9.5	16.2	27.8	28.1	38.7	258	563	570	908
6	80	78	80	80	5.7	7.6	7.5	9.3	14.0	24.5	24.8	35.5	207	462	466	769
7	78	77	80	73	5.7	7.5	7.5	9.0	13.9	23.7	24.5	32.3	217	460	475	744
8	78	77	78	66	6.0	8.0	8.0	9.6	15.2	26.8	27.2	34.6	247	545	554	813
CONTROL	78	76	78	77	5.8	7.4	7.4	8.5	14.4	23.4	23.4	30.1	215	459	459	687

Study area	*Cooperator*
Skykomish	Forestry Research Center Weyerhaeuser Company Centralia, Washington
Hoskins	School of Forestry Oregon State University Corvallis, Oregon
Rocky Brook	U.S. Forest Service Region 6 and Pacific Northwest Forest and Range Experiment Station Portland, Oregon
Clemons	Forestry Research Center Weyerhaeuser Company Centralia, Washington
Francis	Washington State Department of Natural Resources Olympia, Washington
Iron Creek	U.S. Forest Service Region 6 and Pacific Northwest Forest and Range Experiment Station Portland, Oregon
Stampede Creek	U.S. Forest Service Region 6 and Pacific Northwest Forest and Range Experiment Station Portland, Oregon
Sayward Forest	Canadian Forestry Service Department of the Environment Victoria, British Columbia
Shawnigan Lake	Canadian Forestry Service Department of the Environment Victoria, British Columbia

Consultative services have been provided by the University of Washington, Seattle, and the Bureau of Land Management, U.S. Department of the Interior.

Williamson, Richard L.
1976. Levels-of-growing-stock cooperative study in Douglas-fir. Report No. 4--Rocky Brook, Stampede Creek, and Iron Creek. USDA For. Serv. Res. Pap. PNW-210, 39 p., illus. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon.

The U.S. Forest Service maintains three of nine installations in a regional, cooperative study of influences of levels-of-growing-stock (LOGS) on stand growth. The effects of calibration thinnings are described for the three areas. Results of first treatment thinning are described for one area.

KEYWORDS: Thinnings, stand growth, Douglas-fir, *Pseudotsuga menziesii*.

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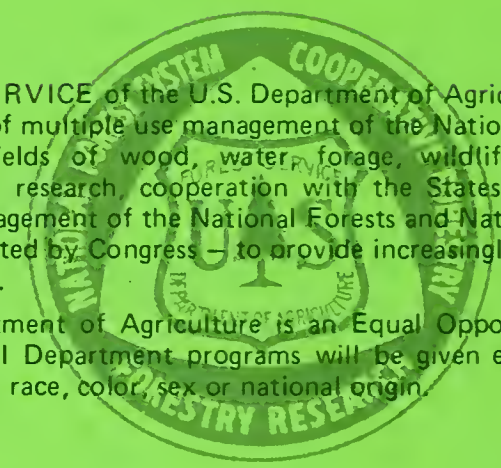

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